TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1876.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1876.

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The Committee on Publication and Discussion take this opportunity to repeat what they have heretofore stated, that the Society is not to be held responsible for the certainty of the statements or the correctness of the opinions expressed in the papers and discussions now or before published, but undertakes only to present these papers and discussions, or the substance of them, correctly. The award of a prize for an Essay is not to be understood as implying that the Committee approve it in every particular, but only that they believe it calculated, *on the whole*, to promote the science or art of Horticulture.

WILLIAM C. STRONG, *Chairman.*

TRANSACTIONS

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BUSINESS MEETING.

SATURDAY, January 1, 1876.

A stated meeting, duly notified, was holden at 11 o'clock, President Parkman in the chair.

The President made no formal address, but congratulated the Society that the Centennial year found it in so prosperous a condition, and that the harmony of feeling among the members had never been greater.

William Gray, Jr., from the Committee appointed at the October meeting, reported the following vote:

Voted, That in the opinion of the Society it is inexpedient for any member to hold office on more than one of the Standing Committees as mentioned in Section III of the Constitution and By-Laws.

The passage of this vote was advocated by Mr. Gray and Edward S. Rand, Jr. It was opposed by Charles M. Hovey, who approved the general principle, but deemed that in the present condition of the Society, with the comparatively small number of members taking an active part in its work, the passage of such a vote might be found embarrassing in the selection of committees. After considerable discussion the report was accepted and the vote adopted.

William Gray, Jr. resigned as Chairman of the Garden Committee, and as member of the Committee of Arrangements and the Committee for Establishing Prizes.

Edward S. Rand, Jr. resigned as a member of the Committee on Publication and Discussion.

These several resignations were referred to the Executive Committee.

The amendment to the Constitution and By-Laws offered by Marshall P. Wilder at the October meeting, and then entered upon the records, came before the Society for action, but was withdrawn by Mr. Wilder.

Voted, That the Recording Secretary be instructed to give the necessary notice for an election of Recording Secretary on Saturday, February 5th.

Edward S. Rand, Jr. declined to allow his name to be used as candidate for Recording Secretary, as business engagements rendered his regular attendance at the meetings very uncertain.

William C. Strong, Chairman, read the annual report of the Committee on Publication and Discussion.

The Editor, Robert Manning, read his annual report.

These several reports were accepted and referred to the Committee on Publication.

Further time was granted to the Finance Committee and the Treasurer for their annual reports.

The following appropriations, having been voted by the Executive Committee, were made for the year 1876:

For premiums on Flowers, ...	$3,200
" " " Fruits, ...	2,100
" " " Vegetables, ...	1,200
" " " Gardens and Greenhouses, .	300
" the Committee on Publication and Discussion,	300
" the Library, ...	300

The President communicated the appointment by the Executive Committee of Edwin W. Buswell as Treasurer, and of Robert Manning as Secretary, for the year 1876.

Joel F. Fales, of Walpole,
James H. Clapp, of Boston,
Edward B. Clapp, of Boston,

were elected to membership.

Adjourned to Saturday, January 8th.

BUSINESS MEETING.

SATURDAY, January 8, 1876.

An adjourned meeting of the Society was holden at 11 o'clock. The President and Vice-Presidents being absent the meeting was called to order by the Recording Secretary, and William C. Strong was chosen President *pro tem.*

The Treasurer, Edwin W. Buswell, presented his annual report.

The Finance Committee presented their annual report.

These reports were severally accepted and referred to the Committee on Publication.

CAROLINE L. TALLANT, of Roxbury,

was elected to membership.

Adjourned to Saturday, February 5.

MEETING FOR DISCUSSION.

William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The following essay, for which a prize had been awarded, was read by the writer:

GRAPE CULTURE IN GARDENS AND ON BUILDINGS, WITH A LIST OF VARIETIES BEST ADAPTED TO SUCH PURPOSES.

—

BY WILLIAM N. BARNETT, WEST HAVEN, CONN.

—

The grape is the noblest fruit that the temperate zone produces. Grain and grapes are royal productions and give to gold its value. A prolonged famine of either would well nigh ruin France, and draw more gold from it than Prussia did by the late war.

Grape culture has its history from the time of Noah: the history of horticulture, therefore, commences at his vineyard. Asia and Europe, in all ages, have devoted their best energies to cultivating the vine and improving its varieties. These, in Europe, are all derived, it is supposed, from the *Vitis vinifera*, and when trans-

planted to America prove, in the open air, a failure in southern and central New England, and the corresponding vine region westward.

These remarks, therefore, will specially apply to this region, but may also be applicable to a narrow belt in proper situations even north of it.

Several species are indigenous to this latitude, but the varieties mostly cultivated are from the *Vitis Labrusca*, with a few known as hybrids. With these specially in mind, a few general remarks may not be irrelevant before proceeding to details; and yet these details must be brief and imperfect, for theory, argument, and fact, all wanted to give it force, must be condensed in an essay like this. But we will glance at the principles involved in the great art of grape culture, the conditions upon which success depends, and the practice best adapted to fulfil these conditions. We can give the ground work to the amateur, and his interest may be enlisted. If so, fascination soon follows and his study becomes a pleasure, while his knowledge is increasing. The use that is made of this knowledge is the key to his success.

The fruiting vine requires a warm, dry, and fertile soil, exposed to sun and air, to rain and dew, and the best results are never realized where any one of these requisites is wanting.

To ripen the fruit of most varieties, about a hundred days must intervene from flowering to frost. Ripeness is indicated by ripe seed; not always by the color of the berry. Unlike the pear, it never ripens after it is picked, nor will the cluster mature after the foliage, at and beyond it, is destroyed. Frozen grapes are without value. To protect the wood and fruit buds through the winter, when the mercury falls much below zero, a slight covering is essential.

Large and delicious clusters for the table are productions of art, and require, while growing, intelligent care and skilful handling; and these can only best be given when the vine is grown and trained in such a way as to be readily accessible to the grower's eye and hand. Not the branches only, but the roots also, should be under his control. These must be drained or watered; must be duly fed and guarded from disease; must be protected from winter's cold, and warmed by the summer's sun, else uniform success can never be expected in this latitude. It follows, therefore, that the most perfect system of grape growing calls for a

sheltered locality of moderate elevation; a warm, moist soil with suitable plant food in it, and a system of growth of root, stem, arm, cane, shoot, and cluster, which shall throw the entire plant under the control and management of the viticulturist.

The many treatises that have been published in this country contain much that is valuable, but a good deal is omitted. It is hardly possible to find in any one or in all, the requisites for uniformly successful grape culture in the open air in New England. Here, to mature the fruit, most vines need all the sunshine over the roots that it is possible to give them, but no treatise directs this, except for terraced localities. They need to be trained, while growing, so that they can be readily laid down in winter, but in most plans for training this is entirely ignored. They need too, on the part of the cultivator, a system of thinning out of fruit and checking of foliage, so that the smallest possible amount of seed (for which alone all plants grow and expend their energies, and thus exhaust themselves) is allowed to the greatest weight of fruit; so that no foliage is permitted but that wanted to mature the fruit, and to form root, wood, and bud to carry the next year's crop; and yet what cultivator bestows on these essentials even a passing thought?

We do not wonder then, when we look around and see, and read in journals of failures everywhere. The ruin wrought by cold, by insects, by mildew, and by untimely overbearing, may well be charged to ignorance and sheer neglect, and the noble vine, the first known plant that received culture at the hand of man, endowed with a constitution capable of flourishing for centuries, comes thus to an untimely end. Abandoned often, it is exterminated from the garden and plowed up in the vineyard; or, what is still worse, left standing as a monument to the memory of its owner's stupidity—diseased, half lifeless, with perhaps here and there a few scattered berries, never destined to mature.

I shall say little about propagation, only noting that plants well grown in the open air are the most desirable, because acclimatized, and no cuttings can be better than those known as "rootlings," because the white roots are in early spring drawn out from the cutting without starting the leaf bud, and they are then in a condition to be set out and to bud out as soon as spring opens, with roots ready formed to sustain them. All vines require one season's growth in the nursery before the final planting.

This essay must be too limited to detail the advantages and disadvantages of planting and training as practised in this and other countries. On the writer's grounds are vines* grown on many of the approved systems. The stool, the stake, the fan, and the Thomery systems may each be suited to some localities. But after years of study and personal attention he is convinced that in this climate the following described plan has advantages possessed by no others; perfect in the garden and unequalled in the vineyard.

First: A vine bed † is prepared, of any desired length, on land of moderate elevation and gentle grade. To do this a trench running northerly and southerly is excavated thirty inches deep by ten feet wide. If gravel or sand is at the bottom, no draining is needed; but if the subsoil is retentive, tile, or other draining, must be laid in the usual way. In this trench, the surface soil is replaced, incorporating with it all such fertilizers as form food for the vine, and in such condition and quantity, especially the inorganic parts, as may be supposed to last for an age—leather, hair, horn piths, bones, spent lime, ashes, muck, leaf-mould, turf, etc. Street scrapings and well rotted manure may also be added cautiously; but these should be excluded from contact with the roots of the vine. When this is filled to the depth of twenty inches, that is, ten inches below the surface, the young vines, of one year's growth in the nursery, or layers of the preceding season, are set out in two rows; each row three feet from the centre, and the vines one foot ‡ apart in the row. A single cane is to be grown from each vine, but two buds are allowed to start. When the stronger has grown a foot, stop the weaker one by pinching, and in the fall trim it off. These shoots as they grow should be tied in pairs to a stake. When the canes reach six or more feet in length, they are layered across the bed near to the opposite sides, each row crossing the other, and are collected in sixes at a short stake to the foot of which they are all secured, as shown in Fig. 1.

For each and every six vines thus collected in a hill by layering, a trellis is made thus: twenty feet from the centre of the bed

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* About 12,000 vines in all, mostly planted since 1860.

† The writer has beds like this, aggregating in length 3,000 feet, with 6,000 fruiting vines on them, from five to twelve years planted.

‡ This distance is preferred to a greater one, say two feet, because the vines are under better control.

a post is set out and another between that and the hill, fourteen feet from the former and three feet from the hill, all in one line, at a right angle with the length of the bed. A simple trellis of two wires * with a rail on top, five feet high by fourteen feet long, with two feet of space between the ground and the lower wire, and eighteen inches between the wires and the rail above. To the rail and each wire two vines are trained, one on either side. The vines are secured by four-inch pieces of small annealed wire, to hold which on the sides of the rail, large tacks are driven. The bending of these short wires is done much more quickly than

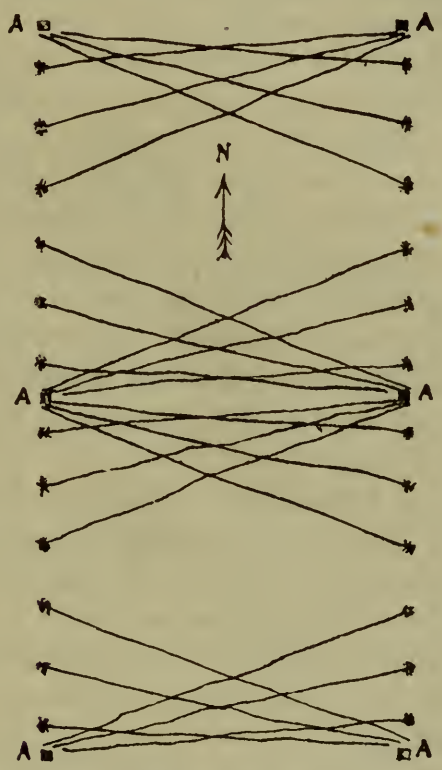

Fig. 1. A, the short stake to which the hill of vines is tied.

tying. The vines thus trained horizontally, and grown each in one single stem and arm or cane, are from seventeen to twenty feet long. On each vine, buds are allowed to grow; the first two feet from the ground, and others one foot apart the entire length; the rest are rubbed out. The shoot from each bud forms a spur on the arm, and each spur is suffered to produce one or two clusters, not more. No canes should be allowed to bear till the spurs are

* If preferred, four wires may be used, with one foot space and one vine on each wire, leaving two vines for the rail. The writer prefers two wires only.

formed. In autumn after the foliage has fallen, the shoots are trimmed to spurs of one or more buds, one only to grow, and the vines are laid down along the bed and covered slightly with turf, sea-weed, straw, hay, or evergreen branches. After the vine is laid down, the plow opens a furrow between the hill and the post, which is three feet from it (the outer sides of the bed), followed by a subsoil plow* which cuts off all roots straying outside of the bed. In April, the covering is removed and the vines are lifted to the trellis. Superfluous buds are rubbed off. The bed is gradually filled till level with the contiguous ground. It is kept free from weeds during the growing season, and is open to the *direct rays of the sun during the best part of the day.* This matures the fruit from one to two weeks earlier than that on vines whose roots are shaded, giving it a higher flavor and greater market value.

In a vineyard, these beds are forty feet apart from centre to centre, and the trellis then is of double length, two sets of vines from different beds meeting at the centre post. The intermediate space of thirty feet between the beds may be cultivated or not. It answers well for strawberries, one row under the trellis, and another half way between the trellises, which are six feet apart. The profit on these berries, with the writer, exceeds the cost of working the entire vineyard.

In a small garden, a main walk through the centre of it, running north and south, after excavating and filling as above directed, might constitute the bed for the roots, the trellises running at right angles on each side of the vine bed or walk.†

Vines on Buildings.—The root bed should be made as already stated; less width is needed for a few vines. It should be as favorable as possible for the sun's rays, and away from the roots and shade of trees. It is not necessary that it should be near the building. The vines, with single canes, can be carried under walks

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* Where the plow is an objection, as in a small garden, the sides of the trench for a part of the depth may be curbed with a two-inch brick wall, thin flag-stone, slate, or tile, or where the subsoil is gravel it could be used with liquid water-cement; the gravel held between two boards, as a mould, one inch apart, and the cement puddled in, and boards removed, which would harden and resist the roots if it stood the frost.

† In Fig. 2, A is the short stake to which the hill of vines is tied; B, vine bed in winter; C, vine bed in summer; D, vines in foliage; E, vines pruned; F, trellis in winter; G, vines laid down and covered; H, line on which the roots are pruned.

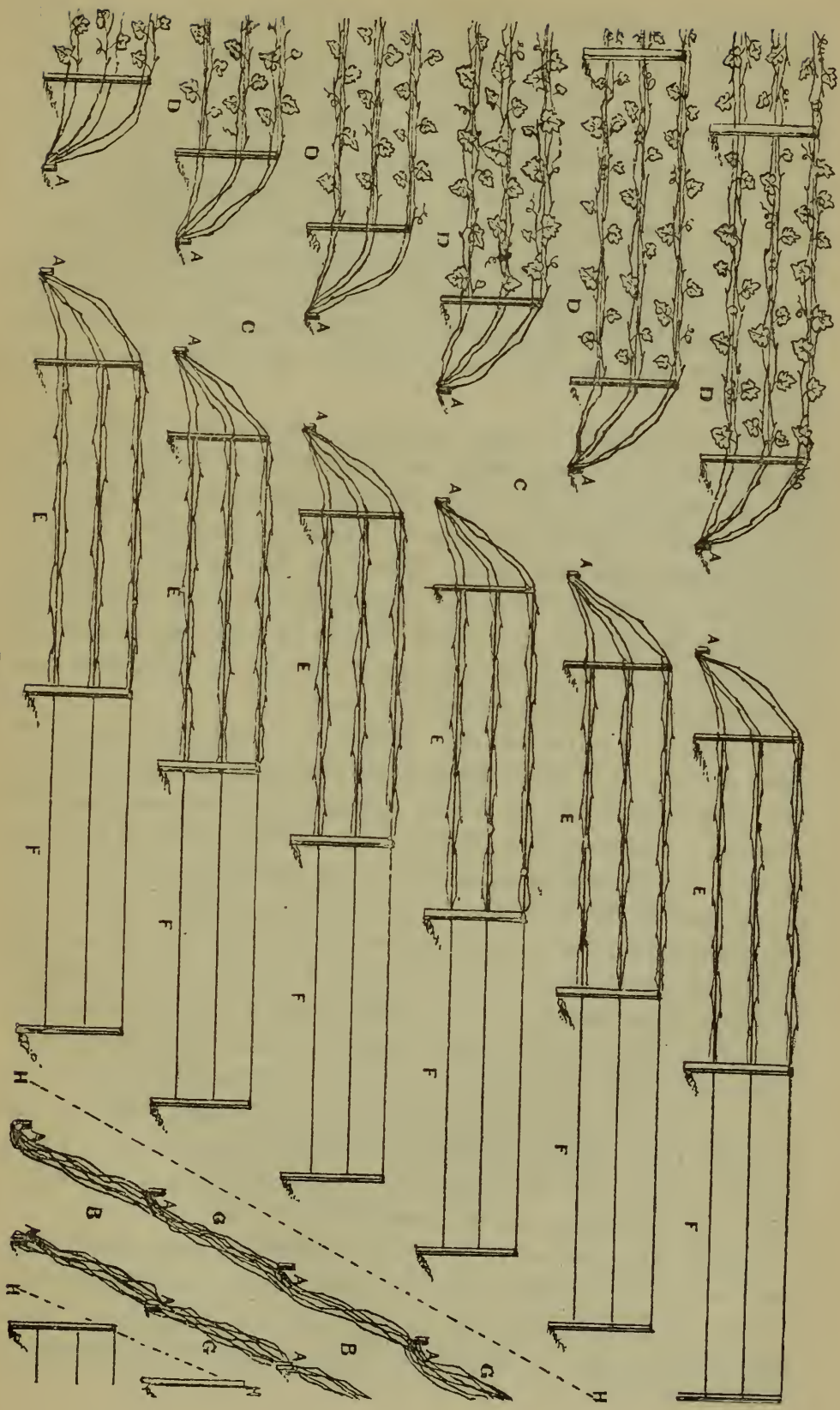

Fig. 2.

and pavements, twenty or more feet, to a trellis constructed on the east, south, and west sides of a building. This trellis should be a few feet from the building and of any desired height, with horizontal wires, three eighths of an inch in diameter and eighteen inches apart, supported by uprights of wood or iron every two or three feet. The vine should be conducted along the upright to the wire upon which it is to be trained to grow and bear, the fruit being produced on a single horizontal arm with spurs, as already stated. As many vines should be planted as there are wires, and these should be firm enough, like a ladder, to sustain the weight of the person who has the care of them. All vines need weekly attention.

Vines on Fences. — Space can be economized in a garden having a fence on the east, north, and west sides of it, by preparing beds of moderate extent, and planting vines one foot from the fence and one or more feet apart. These can be trained horizontally to wires near the fence. They can also be carried perpendicularly to slats or wires, at right angles with the fence, seven feet above the ground, to each of which two vines can be secured. A pleasant walk in summer is under such vines, which with clusters hanging have a most beautiful effect.

It cannot be expected that grapes on buildings will always ripen as early as those in the open garden under the best exposure. The richest fruit is that which grows under the most favorable auspices. The warm and sloping sides of hills covered with calcareous and silicious soils, present great advantages, and are surpassed only by the vine beds in the plan here given; where the sun plays directly on the root bed * unshaded by leaf or cane, for nearly six consecutive hours during the heat of the day, and on alternate sides during the remainder; where its roots are supplied with all the food, organic and inorganic, which the vine requires; where the trellis is so formed that every leaf has full exposure to sun and air and dew, accessible by hand for pinching, training, and guarding from disease and insects, and where the vine is so grown that the single arm, more pliable with increasing age, can be laid down and protected from the severities of winter.

Insects, Disease, and Frost are enemies to the growing vine, and these claim notice. The cut-worm on the green shoot near

* When the fruit is coloring, the bed has a mean temperature of ten degrees greater heat, four inches under ground, than at the shaded sides under the trellises.

the ground, the mealy worm on the starting bud, and a few large insects, are injurious and need watching. *Thrips* is a small insect, wingless in spring, when it attacks the opening bud and blossom, sucking the juices and thus checking the future growth of both leaf and shoot, which soon have a blotched, rusty, and blasted look; later, with wings, it subsists on the leaf. A dry season and shelter tend to increase the numbers, which are often so great as to destroy the vine. They hybernate on the under side of fallen grape leaves and in crevices in wood near by. The remedy is to gather and destroy the fallen leaves when they are damp and cold; the insect then adheres to them. Crevices in wood should be washed with kerosene and soft soap, rubbed together and diluted with tobacco tea.

The root-louse, (*Phylloxera*) is another small insect that burrows in the young roots, sucking nutriment therefrom. The roots become bloated and finally die. The only feasible and effectual remedy is to drown them out by flooding the roots. Any section of a vine bed may be planked at the sides, and, when infested with this insect, flooded for a few days and thus cleared of them. Vines attacked by the phylloxera, when grown in beds like these, have immense advantage over any others where the roots are not under control. Our system here is invaluable.

The fungus known as mildew, (*Oïdium*) attacks feeble vines of some varieties, first appearing in white patches on the under side of the leaf in hot, moist days in June. The leaf soon turns brown and drops off. Mildew also attacks the small green fruit, which soon reddens and ceases to grow, and finally dries up. The remedy is the sulphur bellows, freely used at the first appearance of the disease. To protect the clusters, it is well to sulphur them even before mildew shows itself. The remedy is easy and effectual.

Frost in May often kills the opening bud, and in September the leaf, ruining the ripening fruit. The May and September frosts are usually light, and only a slight protection is wanted. On a clear, still night when the thermometer at sunset falls below 50°, direct radiation, the cause of cold, may be checked by the slightest covering of muslin, fly-netting, or paper. A board one foot wide placed on the top of the trellis is good. For want of these, a smoke started in the garden on the windward side, and kept up at night by brush, leaves, and sawdust, is often effectual.

Varieties, desirable are few in number. Were the Croton and Allen (white), the Iona and Agawam (red), and the Adirondack

and Eumelan (black), varieties without defect, our list would be more complete; but "half hardy roots or canes," or "tender leaf," "subject to mildew," may be said of these and scores of other varieties. The Delaware, for an early grape, and the Wilder for a good keeper, are highly desirable, though the former is a slow grower, and the latter not always proof against the severities of the climate. The Herbert is a large black grape, making fine clusters, early and sweet, and that and the Merrimack, equally hardy, are quite desirable as thrifty and healthy growers, yielding fruit that ripens well and keeps into winter. Rogers' No. 30 and Salem are almost equally desirable; the former, not yet honored with a name, has proved the handsomest in cluster of any grown in this section, while the berry is large, pulpless, and of pleasant flavor. These are all better than the Concord and Martha, the Hartford, the Ives, and the oft rejected Clinton; and yet the Clinton, well grown, is good, sprightly, sweet, and vinous, and the other four, as well as it, are so thrifty, so healthy, so hardy, and mature so early, that we must give them the preference as being the most profitable for general cultivation, as well as best adapted for gardens and buildings. Where foliage more than fruit is sought for a southerly shade or arbor, the King, or Golden Clinton, excels for rapid growth, and has a rich and glossy leaf. The small clusters of white fruit keep well into winter. After testing over sixty varieties, and with an experience in handling thousands of fruiting vines for many years, we regret our inability to furnish anything more than such a list as one which advanced grape amateurs will smile at when they see it. The Hartford, the Concord, and the Martha (white), for the table and for market, and the Ives and Clinton for wine, will yield, under ordinary care, abundance of desirable fruit, though not of the choicest quality, and this is more than can be said of most varieties. Varieties are increasing, needing further trial before warranting, among which are Cambridge and Cornucopia (black), Brighton and Challenge (red), and Elvira and Lady (white), with many others.

Discussion.

Before the essayist had finished reading his paper a discussion arose on the question, whether or not vines were injured by bleeding.

Mr. Barnett had not come to any conclusion, except that it may retard the bud in early spring.

Marshall P. Wilder had caught three junk bottles of sap from

a single vine in his greenhouse, but did not think bleeding injurious.

Charles M. Hovey thought that it injured the vine, not by exhaustion, but by keeping the young terminal buds moist and in a condition unfavorable to free growth.

Dr. G. F. Waters knew a large, wild grape vine in Maine, three inches in diameter, from which a branch an inch in diameter was cut off early in spring, three or four feet from the main stem. The vine bled profusely and never leaved out.

Mr. Hovey thought that this old vine might not have had latent buds enough to start. He did not think that bleeding retarded the budding out of the vine. He had never noticed much difference in the starting of growing vines after being headed down, whether it was done early or late.

Robert Watt differed from Messrs. Wilder and Hovey. He would prune vines in November or December — pruned later they would be injured by bleeding, and if not pruned until March they would not burst an eye. They bled more from the canes of the previous year than from older wood, more when pruned long than when spurred, and more in wet weather than in dry. He had lost vines as the result of bleeding; they died down to the last year's wood.

Mr. Hovey had had under his observation from two to four thousand foreign vines every year, for many years, which had been headed down in the spring to two or three eyes, and he had never, to his knowledge, lost any vines from this cause.

Mr. Watt said that he never cut a vine when he planted it, but set it out at full length, rubbed out all the eyes not wanted, and cut off in June or July.

Josiah W. Talbot said that he pruned Concord and other native grapes when convenient, and had never lost a vine from bleeding.

James Cruickshanks said that wherever there is late pruning there will be bleeding, and asked if this did not weaken the vine.

Hervey Davis had pruned at all times and found no injury. He had not noticed any weakening of the vine.

Mr Hovey said that though vines might not be injured by loss of sap when pruned late, yet early pruning was altogether best. The sap of trees is in motion all the time, as is shown by the fact that the buds of maple and poplar trees swell gradually through the winter. If the vine is pruned early the sap accumulates in

the last bud, giving it additional force, and he would therefore prune in autumn. Camellias or azaleas headed down in October start strongly, but if cut back in April only a few of the top buds break, and those more weakly.

Mr. Watt asked whether the vines which bled profusely had not thrown out thin papery leaves and wiry shoots, and shown other marks of weakness.

Mr. Hovey had noticed no such signs of injury, but believed that an old vine with few buds might be injured by heading down — not, however, from loss of sap but from repletion.

John B. Moore had pruned at all times, and did not think that it made any perceptible difference with out-door grapes when they were pruned. Still, he would rather not have his vines bleed.

Dr. Waters said that though he had stated a fact in regard to the destruction of a large wild grape vine by bleeding his practice had been to prune when he could, but he preferred the fall for old, and late spring for young vines.

Mr. Barnett exhibited pieces of the vine — arms of old wood — amputated and coated with liquid rubber. From these, when cut in the fall, gum exudes as shown in the specimens, to prevent which the ends were covered by a cement made by dissolving rubber, cut finely, in benzine. He preferred it to liquid grafting wax or dissolved shellac.

The reading of the essay was here resumed, and on its conclusion discussions and inquiries followed.

Mr. Talbot asked whether the vines on the trellises, running east and west, did not shade the ground from the sun.

Mr. Barnett replied that in his system it was immaterial whether or not the ground under the trellis was shaded, because no roots were there, but in the vine bed; the object was to expose all the foliage to the sun and the air.

Mr. Talbot wished to know whether the sun shone on the north side of the vines in September, when the grapes were ripening.

Mr. Barnett replied that the direct action of the sun was needed, not so much on the ripening fruit and wood, as upon the leaf (the upper green surface), and that he believed his trellis exposed every leaf to the sun and air. He read the following extract from Du Breuil:*

* Vineyard Culture, p. 101.

"We know that the direct action of the sun on the entire vine and the soil which gives it nourishment, affects, in an important degree, the quality and quantity of its produce."

He thought that his method hastened the time of ripening from ten to twelve days. His fruit ripened and was sold before his neighbors'. He marketed Concords on the 8th of September, and at that time, and for two weeks after, he had the command of the New Haven market. His idea is that the direct action of the sun on the roots and foliage makes the fruit earlier and sweeter. He did not mulch. On the 20th and 21st of August, when this essay was written, his grapes were coloring, and the mercury in the thermometer averaged, in the soil of the warm vine bed, eleven degrees higher than in the shaded ground at the sides of it, thus giving him the benefit of a climate like that of Vineland, N. J. He thoroughly ripened Concord grapes as early as the middle of September the past season, which was about two weeks later than usual, when most of the Concords in his vicinity failed to ripen before October.

Mr. Hovey said that in 1854 Mr. Bull had Concord grapes fully ripe September 7th, on a sandy sidehill. He thought it did not matter much where the top of a grape vine was, if the roots were in a warm place. He had known Clintons to ripen on top of a maple tree fifty or sixty feet from the ground, when on low trellises they were far from maturity. Mr. Barnett's success was owing to his ground being exposed to the sun.

Mr. Davis thought thirty inches rather deep for the vine bed.

Mr. Barnett said that he began with soil on his land six inches in depth and had been gradually deepening, and now it was mellow and rich down nearly two feet. While his neighbors' strawberries suffered in dry seasons, those which he grew between the trellises were fine, and brought him, at wholesale, thirty cents per quart throughout the season. These retailed for thirty-five cents, or about one cent apiece, being mostly Jucundas, which take thirty to forty berries to make a quart.

Grape roots vary; some, such as the Clinton, have fibrous roots like the maple, while others, such as the Agawam and Catawba, have finger roots, like the tulip tree. In his vine beds, thirty inches deep, they never break down in time of drought, the larger roots sucking up moisture from below while the fibrous roots are feeding near the surface.

J. M. Merrick, Jr.,* had recommended to plant grape vines, twelve to fifteen feet apart every way, but Mr. Barnett could not concur in this, because the vines while young will run too much to wood, and Mr. Merrick found it so, for in the same article he complained that he did not get one-fourth the fruit he should, while Mr. Barnett pinched off two-thirds from his as surplus clusters.

The plan of close planting and collecting six together is an innovation, but when it is followed and the roots confined to the vine bed by root pruning, the vines are under control. He pinched them once during the season, and after that they needed little more pruning; none, if the eyes beyond the cluster were dug out or blinded. The small fibrous roots were mostly within six inches of the surface, where surface fertilizers readily reach them. He put muck at the bottom of the beds, and after that old turf, spent lime, horn piths, etc., as stated in the essay. Then, after the vines are layered across and into hills, all the grape trimmings and other refuse were put in to fill the bed up as high as the sides of it.

Mr. Hovey said that bringing the vines across the whole breadth of the trench, afforded more exposure to the sun. Mr. Barnett's plan was the same as Du Breuil's system of cordon training, and the old Thomery system, under which the grapes were excellent because the roots were exposed to the sun.

Mr. Barnett said that William Saunders, of the United States Department of Agriculture, with his brother, who is also good authority, said, when they visited his grounds, that he would raise very large and fine clusters by the method pursued. He would plant grapes where you can roast the roots, and sun and air the tops. He had laid the tops down and carried them under ground to buildings, as described in the essay. Dr. Frederick Mohr, one of the best authorities in Germany, a friend of and co-worker with Liebig, says that the sun eliminates oxygen from the leaves, leaving carbon and water; and that, without this action, there are no rich products stored up in the vine. The nourishment is taken by the root and conducted to the leaf, where the carbonic acid is decomposed by the sun acting on the leaf, eliminating oxygen and leaving hydrates of carbon, such as grape sugar, starch, woody fibre, and the other rich products of the vine, so that the root, the leaf, and the sun must all work together to perfect the crop.

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* Tilton's Journal of Horticulture, Vol. IV, pp. 242—244.

In answer to an enquiry Mr. Barnett said that, after pinching, the laterals do not grow long enough to be troublesome. He pinches the shoots two leaves beyond the cluster as soon as the vine has done blossoming, and removes all but one cluster of fruit. Dr. Waters asked what would be the effect if the leaves at and beyond the cluster were removed; and Mr. Barnett's reply was that if that took place before the fruit colored, it would be hard and sour as vinegar.

Dr. Waters said that he could show bushels of Clintons grown at the ends of the shoots, as sweet as ever Clintons were.

Mr. Barnett said that he could not agree with him from his own experience, and referred to standard authorities to corroborate his statement.* In reply to a question, Mr. Barnett said that he left the end of the main shoot unpinched, for a safety-valve, and sometimes another strong shoot where an arm was to be replaced by a new one.

Mr. Hovey said that the immense bunches of grapes that have been grown in Europe within the past few years, have been borne mostly on long shoots. Every bit of growth that you can get at the extremity adds so much to the strength of the vine.

Mr. Barnett exhibited a portion of a root which had had the end cut off in root pruning, showing that they do not extend much beyond the beds. The laterals, which start after pinching, extend about a foot from the trellis. In building the trellis, where there are parallel vine beds, a large post is required in the centre, but at the ends a fence picket three inches wide by six feet in length is sufficient, as the vines brace the ends. He used old telegraph wire, which he bought at a low price, preferring it to galvanized wire, as less apt to burn the shoots, on account of its rust. He estimated the cost of excavating, refilling, fertilizing, stocking the vine bed, and trellising, at twenty-five cents per vine; that the value of the vines, if cultivated and uncropped, would increase to double this cost, annually, for six years, and then might be suffered to bear and produce annually three or four tons of grapes per acre, equal to three or four hundred dollars at the present value, and that there are one million acres of waste land in this State suitable for the vine. As the trellis covers three-fourths of the land, the soil from it, if not needed for other uses, might go into the vine beds

* See Mohr on the Grape Vine, New York, 1867, pp. 30, 31.

on the remaining fourth. In order to awaken interest, the State needed a sample vineyard, and a public teacher, as in France, where one-fifth of the entire vine region is utilized in grape culture. He exhibited pieces of wire and rail from his trellis, showing its simple construction and the facilities for attaching to and detaching from it, the vines. He spoke of a horizontal or platform trellis about two feet from the ground, with wires occupying all but a two-feet walk, but he preferred the vertical one described in the essay; and hills of six, instead of hills containing three, or half the number of vines, as by close planting he better controlled the growth both of root and shoot. As for protection in winter the single arm system best facilitates it; the rest of the pruning—the canes and spurs—is optional. A well developed bud on a long or short spur will always fruit if the wood is rightly grown. Mr. Blanchard says he has raised clusters from sixteen to thirty ounces in weight. Mr. Barnett had raised them as heavy as twenty ounces, but a pound is large enough. He started on the two-armed system, but could not lay the vines down, while the single arms can be easily swung round and a little trash thrown over them. Even perfectly ripened wood is better laid down, because if not winter killed by exposure yet the buds make a better start in spring. He had lost buds and spurs on ripened wood by not laying down, and the expense was not five dollars per acre. The vines should not be layered before they are long enough to reach across to the hill, as it would otherwise produce confusion. All shoots or suckers proceeding from the layered canes are cut off in hoeing, and all the prunings, leaves, etc., are placed in the trench. Nothing is burned except for making smoke on frosty nights.

Mr. Moore said that in his experience it made no difference with regard to the vines whether he pruned early or late, but if he pruned early the work was out of the way. Bleeding, if it does no harm, does no good. Deep borders certainly make the fruit later. Of two Isabellas which he planted, one in a one foot and the other in a three feet trench, the fruit of the latter was two weeks later. In this latitude we must get our grapes ripe in less than a hundred days from blooming. His grapes did not bloom until the 23d of June, and he commonly got grapes fit for market the middle of September. Mr. Barnett thought grapes would not ripen as early when trained on a building as on a trellis, but Mr. Moore said they would, if the border was on the south side of the house.

Mr. Barnett had recommended the Delaware, Merrimack, Wilder, and similar varieties, but he winds up by saying that none are reliable but the Hartford, Concord, and Martha. Any system that will give you a trellis of well ripened wood will give you grapes. Mr. Moore did not believe in laying down and covering vines. Concords with well ripened wood will stand 20° below zero. His vines are not injured in the tops by such severe cold, but the roots are killed. He thought sudden changes worse than extreme cold. He finds that the fruit ripens earlier when the ground is mulched—the gain by protecting the roots compensates for the loss of heat in summer.

The native and foreign grapes are very different in habit—the native will not stand severe pruning. In the Concord the base bud is apt to be a leaf bud, and consequently the spurs should not be pruned back to a single eye. He was surprised at Mr. Barnett's statement that grapes would not ripen as early when trained on buildings as on a trellis, and he had been astonished to find grapes ripening earlier on stakes than on trellises, but he quickly saw that the reason was that where they were tied to stakes more sun was admitted to the ground. He took the premium on grapes the 4th of September, less than seventy days from the time of blooming, though we are a week or ten days later than at New Haven.

Mr. Barnett replied that Mr. Moore had misunderstood his statement in regard to the comparative earliness of grapes on buildings and on trellises, and referred to the essay, which reads thus about "grapes on the east, south, and west sides"—"It cannot be expected that grapes on buildings will *always* ripen as early as those in the open garden under the *best* exposure." "As to the time required for the maturing of grapes, Mr. Moore had spoken of seventy days from blooming, which would be grand if possible to *fully ripen* them in that time, but Mr. Barnett assured him that what he had said in the essay, viz., "about a hundred days must intervene from flowering to frost" was strictly correct, and his own observations were confirmed by those of others, in support of which he referred to the article, "Grape Statistics," at Newburg, N. Y., in the "Horticulturist," Vol. XX, p. 23; which reads thus: "Any one that will *fully ripen*, year after year by the 25th of September is worthy of cultivation, say within *one hundred days after blooming*. The time varies from 90 to 122 days," "as shown in the

following table:—Allen 95, Catawba 102, Concord 96, Delaware 99, Hartford 90, Anna 122, Clinton 107, Diana 108, Isabella 105, Northern Muscadine 93, Rebecca 97." "Blossoming averages about the 15th of June."

Mr. Wilder said that though gentlemen may believe that well ripened wood will never be injured, there will come a winter when even the hardiest, Concords and all, will be injured if exposed. Mr. Barnett had quoted Du Breuil and other foreign authors, to which a gentleman had made exception, as inapplicable here. But Mr. Wilder said that the laws of vegetable growth, as given by those writers, were unchangeable, and applied as forcibly here as in Europe. And he further remarked that the essay and its discussion had proved a matter of much interest to him, for which he made acknowledgment.

The essay was illustrated by diagrams on the blackboard, and drawings on the cover, and the discussion was longer and more animated than any previous one. The meeting adjourned one week for further consideration of the same subject.

MEETING FOR DISCUSSION.

SATURDAY, January 15, 1876.

In the absence of the President and Vice-Presidents the chair was again occupied by William C. Strong, Chairman of the Committee on Discussion, who called on John B. Moore to open the discussion.

Mr. Moore said Mr. Barnett's essay was very well written, and though he differed from many of the positions taken in it, he felt much satisfaction in listening to it.

Mr. Barnett wanted a soil both warm and moist, which is an impossibility, for the effect of water is to make the soil cold, but probably he did not mean a wet soil. He wanted a sheltered place for his vines, which Mr. Moore agreed was desirable. He had the vine bed filled with lasting fertilizers, forming almost such a border as those formerly made for foreign vines in houses. Now

a deep border means late ripening, and in this climate we cannot spare a single day. If you require a longer season to ripen the fruit, you must have the same for the wood. Mr. Moore again spoke of the two Isabella vines to which he alluded at the previous meeting. These both had a southern exposure; the first one planted had very little preparation, but in the hope to get finer fruit from the second the border was made three feet deep, and to his astonishment the fruit was ten days later than that of the first. Mr. Moore did not believe we needed a border of greater depth than that of ordinary plowing. Mr. Barnett's vine bed occupies only one quarter of the ground; that is, the roots of an acre of vines are confined to a quarter of an acre. Under these circumstances the roots must fill the border as those of a plant fill a pot, and the vines struggle one with another, and they are root pruned besides. The vines are not allowed to have their own way, and Mr. Moore had sometimes thought it desirable to let them have their own way a little. Mr. Barnett, however, must crowd and prune the roots of his vines because his border is so rich. Mr. Moore had never seen any variety of *Vitis Labrusca* grown in this way that did not lose its vigor. Perhaps under Mr. Barnett's system, when the roots are in the same condition as those of a pot-bound plant, it is necessary to make the border as rich as he does and the moist soil, which is not generally desirable for vines, might be proper where the roots of an acre of vines are confined to a quarter of an acre.

Any vine started at an angle with the ground can be easily laid down, whereas if grown upright it cannot be. Mr. Moore thought it would be necessary to lay down vines grown in such a rich border, and he asked if it would not be better to grow them so as not to need laying down. Although Mr. Barnett had a difference of two weeks in his favor, Mr. Moore found no difficulty in ripening wood. Vines grown in soil rich enough to produce from forty to fifty bushels of corn to the acre will ripen their wood, though larger than that which Mr. Barnett exhibited here.

Mr. Moore regarded the method of pruning as of very little consequence; one might be more convenient than another, but the object is to get grapes, and any method that would fill the trellis with short jointed, well ripened wood will effect this. He had tried many plans, including the renewal, under which you might succeed for a year or two. He thought it desirable to prune in the

fall, as the most convenient time, but having left two rows, and pruned them in March, he was surprised to find that they leaved out earlier than those pruned in the autumn. He did not agree with Mr. Hovey's view that when vines were pruned early the sap would accumulate in the buds and perfect them. He would raise well ripened wood and not lay it down.

Col. Wilder had said that however grape vines might escape in ordinary seasons, once in a while there would come a winter when they would be killed, and we should lay them down to insure against such seasons. This might be true from his stand-point, for his soil was rich and strong, and he did not get good grapes. His soil is well suited to pears, but not fit to grow grapes on, and Mr. Moore did not think his opinion on grapes as valuable as on pears.

Mr. Barnett had condemned the Croton, Allen's Hybrid, Iona, Agawam, and others, and Mr. Moore agreed with him; and though Mr. Barnett thought better of the Wilder, Delaware, etc., he wound up by recommending the Hartford, Concord, and Martha, for table, and the Ives and Clinton for wine. The Clinton can only be grown on long canes, and if Mr. Barnett followed up his system with the Concord, in a few years they would be a failure, for the base buds would all be leaf buds. Every one would agree with Mr. Barnett as to the necessity of sun on the border. Mr. Moore said he would rather grow grapes on a trellis than on stakes, but he had been forced to the conclusion that they would ripen a few days earlier on stakes, though the idea was expressed in books that they would ripen earlier when the vines were spread out on trellises. Mr. Barnett had quoted Du Breuil as authority, but the principles which he laid down applied only to the foreign grape, aud no more to our native grapes than to a shrub oak. Dr. Warder, in editing the book, questioned many of the positions of Du Breuil.

Robert Manning said that Mr. Moore was mistaken as to the character of the soil where Mr. Wilder's grapes grew. It was true that most of the soil where his dwarf and other pear trees were planted was strong and moist, but the grapes grew on a slope facing the southwest, where the soil was warm and but moderately rich.

Charles M. Hovey thought Mr. Barnett's paper very good indeed. Outside of the regular cultivators of the grape there were

but few who know that the grape vine bears only on the young wood, and but once on the same wood, and not, like a pear tree, on the same branch or spur for an indefinite number of years. It is information on such points as this that we want. As grapes are commonly planted there is no need of the bed, but with Mr. Barnett's system there is. At Thomery, near Paris, bunches of the Golden Chasselas weighing about half a pound each are raised by the ton and sent to the Paris and London markets, where they have gained a high reputation.

The Thomery system is to plant the vine ten or more feet from the wall or trellis, and to lay the vine under the soil until it reaches the one or the other, thus supplying rooting surface, just as Mr. Barnett does by his system. It is nothing new. In cultivating the vine much depends on whether the object is grapes or wine. A depth of thirty inches is not extravagant when the vine roots are laid across the border as Mr. Barnett advises. We must guard against the extremes of heat and aridity. At Rochester last fall, he saw Catawbas in the grounds of Mr. Ericsson, where, under good common culture, he raised them in perfection, and he had a vineyard where he had raised fifty-two tons of Catawbas on thirteen acres of land; but perhaps the proximity to the lake made the climate more favorable. In every system we can avoid what is unprofitable and accept that which is suited to our needs. If we understand the principles of cultivation we shall succeed; if not we shall fail. We require all the sun heat we can get, and should prune so as to have as little two year old wood as possible, for that is useless except as an extension of the vine.

Josiah W. Talbot, being called on by the Chair, said that the question before us was of the profit we are to get from our vines. Mr. Moore's remarks corresponded exactly with the views of Dr. Fisher, of Fitchburg, who had been very successful in growing native grapes. Horace Eaton, who had taken the prizes at our exhibitions for Allen's Hybrid and grapes of similar character, raised them on a heavy clay soil, thoroughly underdrained. All the merit he claims is in the simplicity of his culture. He lets no vine grow above four feet high, and the same arms fruit for ten years. Mr. Blanchard, of East Stoughton, prunes on precisely the same system as Mr. Eaton, and raises bunches of a pound weight each. His method of pruning and training is the same as Mr. Eaton's; he raises two arms twenty inches from the ground and

each four feet long, the ends being pinched off. These arms are retained until old; four or five laterals are allowed to grow on each cane, making eight or ten in all. The laterals are pinched off a first and second time, and never get above eighteen inches long. He always saves the axillary bud, and sometimes two buds, as one may dry up. He lets only one bunch of fruit grow on the axillary bud and two on the other. After blooming he pinches off the superfluous clusters and the end of the shoot, always leaving one good leaf. He raises from twenty to twenty-five pounds of the handsomest fruit on each vine. His land is no better than is ordinarily planted with corn, and has not had manure enough to raise a good crop of corn. The shoot from the axillary bud makes the spur for the next year. He has never sheltered his grapes.

Mr. Talbot thought Mr. Moore right in regard to deep culture, and such were also Dr. Fisher's views. When Mr. Barnett's vine bed is filled level with the soil on each side, the roots will be fourteen inches below the surface, which is eight inches too deep. Mr. Blanchard says, "Never grow an inch of extra wood; throw the whole power of your vine into the fruit." No vine draws its nourishment two years from the same place. Too much power is wasted in growing extra wood. It is as easy to grow fruit as wood. Dr. Fisher raises a new arm every year, removing the old one, and this Mr. Talbot thought an instance of the waste of root power.

Henry F. French said the question was whether we should prune to close spurs or whether we should let our vines run more freely. Many persons who set their vines near together with the idea of pruning closely, had taken out half the number, to give the others more room. He questioned the possibility of pruning so as to throw what would otherwise be wood growth, into the fruit. It was curious to see how the same questions in horticulture came round in from twenty to fifty years. Mr. French here referred to a copy of "Cobbett's American Gardener," published in 1821, containing directions, with diagrams, for training and pruning the grape on the renewal system, with two growing and two fruiting branches trained horizontally on each side, each vine occupying sixteen feet of trellis. He said that when a boy, about fifty years ago, he cultivated Catawbas according to these directions, on the top of a hill in Chester, N. H., and they ripened two years out of three. He had no difficulty in getting plenty of fruit, though the

system required more care than spur pruning. The Isabella is still raised in Chester and sent to market; they escape frosts there. The Catawba ripened as early as the Isabella; they were never covered in winter and never killed.

Hervey Davis regretted that the essayist had not said more about varieties and culture for amateurs. He had grown grapes for fifteen or twenty years, and had never succeeded better than when he trained them on stakes; he thought they were then most easily pruned and best exposed to the sun and air. His plan was to take up three shoots to three stakes, and once in a few years, when they needed renewal, to take up a new one. He would lay down vines, and thought Mr. Moore might have saved his by covering.

Mr. Moore said that he had never lost any vines by the tops winter killing, but he had lost a solid half acre by the killing of the roots. He mulches them now with three or four inches of refuse bristles, and does not lose them. The temperature of the ground does not rise so high as if they were not mulched, but, to compensate, it never falls as low, and the mulching saves the trouble of weeding. He has one vineyard where there has not been a hoe, plough, or manure, for eight years, and it has continued to produce full crops of good fruit.

Mr. Davis remarked that while Mr. Barnett and Mr. Moore discarded the Iona, he had ripened it seven years out of eight, by covering the vines during winter with straw or hay. It had the same treatment as twelve other varieties that he cultivated.

The Chairman said all would agree that Mr. Barnett is a very careful observer. He thought his system excellent in many respects. Though the plan of crossing the roots and taking six canes up one post was, in his opinion, objectionable, these were not material parts of the system. There was no reason why we should train two canes on one rod, and with one tier above another the upper would be likely to shade the lower. He liked the plan of allowing the laterals to arch over, without tying, as it checked their growth and saved the need of so much pinching. The main point brought out by Mr. Barnett was admirable—the carrying the vines away from the roots, where they do not shade the ground. He approved of root pruning, if the roots were inclined to run under shade, and thought the pot-bound condition serviceable in producing fruitfulness; the roots are kept within bounds. He

had no doubt that when the Concord failed it was often caused by planting too thickly and shading the ground. Keeping the roots fully exposed to the sun is most important. He did not think that Mr. Moore's mulching hindered the ripening of the grapes.

Mr. Moore asked what would be the effect on a plant of being pot-bound for years.

The Chairman replied that it would need to be fed more liberally, and that was the reason why Mr. Barnett made his border so rich. If well drained no ill results would follow from depth of border.

Robert Watt asked whether failures did not arise from close root pruning. He thought they did, and also from not pruning the tops closely enough. He alluded to a grower in Philadelphia, who made a failure in growing grapes on the pot-bound system, and said he agreed with Mr. Moore on this point. He had taken up grape borders made with bones, horn piths, leather, etc., and never found a root that had taken hold of either until the bones were so decayed that they would crumble when rubbed in the hand.

Mr. Talbot remarked that Mr. Blanchard never laid down his Concord vines. Mr. Eaton always covered his Ionas and similar varieties.

James Cruickshanks said that those who had grown good fruit had found a gain of a fortnight by covering Isabellas.

Mr. Talbot said that vines should always be covered when the wood is not ripened. He thought it possible that the wood might ripen after covering.

Marshall P. Wilder differed from the last speaker in regard to the ripening of the wood after being laid down. The functions of the plant have ceased when the leaves have fallen, and there can be no further ripening of the wood. As to pot-bound plants, the Chinese will grow one in that condition for fifty years by proper feeding. He was pleased with the sound physiological principles laid down by Mr. Barnett, especially in regard to the exposure of the leaves to the sun. Mr. Barnett showed that the roots had been confined to the bed, where they had received constant nutrition. Mr. Wilder thought the two great points were confining the roots to a warm bed, and exposing the leaves to the sun. These principles are so sound that they need not be discussed. There is a difficulty, as Mr. Moore has said, in letting the roots run deep in a cold, wet border. This can only be remedied by thorough drainage, which is the first letter in the alphabet of good culture.

You might as well expect a man to thrive by eating a good dinner with his feet in ice-water, as a vine to thrive, though well manured, with its roots in a cold, wet soil.

Mr. Moore asked how a soil could be both warm and moist.

Mr. Wilder replied that he had a sand bed for striking cuttings, and this year he had in it much coarser sand than usual. The sand is moist, but warm, for the drainage is perfect, and his cuttings strike better than ever before.

The Chairman referred to Mr. Barnett's essay, and showed that he had spoken of a warm, dry soil, as well as a warm, moist soil, being required by the grape, and said that we must reconcile these statements as we best could. He thought that in providing such a depth of soil Mr. Barnett meant to have it moist.

Mr. French said that a thoroughly dried soil would absorb half its weight of water. Soil that is drained will hold more moisture than an undrained soil.

Mr. Moore asked, Is not the reason that Mr. Barnett wants a moist soil, that he has got an acre of vines on a quarter of an acre of ground?

Mr. French said you cannot heat water from the surface, and it is the same with soil. In a cold season the heat does not go down in an undrained soil as in one that is drained.

James Murray remarked that there were exceptions to all rules, and that he knew of a standard Lawrence pear tree which stood on the banks of the Charles river, with the roots not more than two feet above the level of high water, where the ground in spring is a perfect marsh This tree is every season loaded with the finest fruit, so as always to excite his astonishment, but he would not like to plant an orchard of pears on such soil.

Mr. Wilder added, as another apparent exception to a general rule, that though the Beurre Bosc is commonly supposed to require a warm soil, the tree which produces his best fruit of that variety stands in a low, wet soil, where hundreds of dollars worth of trees around it have been killed by standing water. Such instances, however, do not invalidate the general principle.

James Cruickshanks would let vines have all the rain, but it has generally been considered that dew is one of the worst things you can have on vines, causing mildew. William Saunders, of the Agricultural Department at Washington, furnished his trellises with copings to protect the native grapes from the fall of the dew.

Mr. Talbot said he had a Delaware vine in a cold grapery where it never had rain or dew, and it always bears fine fruit.

Mr. Moore said that where his vines were mulched the ground underneath was so full of roots that he could not plow it; they are within two inches of the surface. All he has to do is to tie up the vines and pick the fruit. No weeds grow there, and the mud does not spatter up on the fruit. He thought the *average* temperature of the soil was higher than when it was not mulched.

Mr. Talbot said the fact that the roots come so near the surface shows that they do not want to go deeper.

Mr. Wilder said we live at the northern limit of the grape region — almost at the jumping off place — and we cannot be certain of our crops without covering. He asked Mr. Moore whether he had had any vines split open by the cold, and said that he had already noticed trees cracked open by the cold in November and December, and he believed that in spring vegetation would be found much injured. It would save a great deal of trouble if we could keep our vines up all winter, but every few years we have a season which destroys all the wood, and the only sure way to prevent it is to cover every winter.

Mr. Moore said he had no more doubt than he had of his own existence, that on a warm, dry soil, with hardy varieties — not hybrids — vines would ripen their wood as certainly as apple trees. When vines are grown in rich soil and make coarse wood, laying down is the only way you can save them.

Mr. French thought this was a very important matter, and that if Mr. Moore had laid down the vines which were killed, he would not have lost them. He covered his every winter, and even the Isabellas were sure to live. By covering, you escape winter killing, which is nothing but the injury to unripe wood by changes of temperature.

Mr. Moore said that the tops of his vines were not winter killed, for cuttings from them grew, and the tops themselves grew two or three inches. Vines near by, which were mulched, were uninjured. Vines with the best ripened wood would be liable to be killed by the roots freezing, when the tops were not injured.

Mr. Wilder mentioned a case of injury to an orchard of dwarf Beurre d'Anjou pear trees, which he saw at Lockport, N. Y., by killing of the roots when the ground froze very deep. Another square of standards adjoining was uninjured.

Mr. Moore said that he had an Isabella vine split open, but he did not consider it a hardy grape and would not cultivate it. It must be laid down.

The Chairman remarked that we sometimes do have winters that kill the tops and do not kill the roots.

Mr. Talbot said that, though the commonly received idea was that plants were injured by freezing and thawing in sudden changes of temperature, the winter of 1874-5 was all freezing and no thawing, and plants never were so much injured.

Mr. Davis thought that covering the tops would also benefit the roots.

Mr. Talbot suggested the influence of the scion on the root as a subject for discussion at a future meeting.

Mr. Davis suggested the best varieties of fruit for cultivation.

The Chairman remarked that he had been asked whether these meetings were open to the public, and said that the Society, in seeking to diffuse information on horticulture, did not intend to confine it to the members alone, and that all interested in the subjects discussed would be welcomed.

MEETING FOR DISCUSSION.

SATURDAY, January 22, 1876.

E. S. Rand, Jr., made some remarks on a fine specimen of *Lœlia anceps* exhibited by him. It is a most beautiful genus and this is one of the finest species. It is difficult to convey in words an idea of the beauty of the delicate rosy purple petals and the deep rich purple of the lip. The flowers are produced on long, slender, gracefully drooping stems. The plant had five spikes, bearing in all fourteen flowers. This species is a native of Mexico, and was introduced into England in 1833, but its wants were not understood, and for many years it was grown in a small and imperfect condition. The *Cattleyas* and *Lœlias* are very closely allied, the only distinction being in the number of pollen masses, the former having four and the latter eight. In orchids the pollen is held under the column, and they require the agency of insects in fertilization. The flowers are very long lived; those on the plant

exhibited had been in bloom for three weeks, and would probably last two weeks longer. This long duration is due to the fact that they are not fertilized; like all other flowers, they decay immediately after fertilization. This plant began to throw up its flower spikes in August; they had at the termination protuberances which in November began to swell, and ultimately developed into flower buds. The genus is one of the easiest to grow; it can be cultivated in a common conservatory or greenhouse. West Indian and Mexican orchids dwindled and died under the treatment formerly given them under the misapprehension that they required the same culture as the East Indian species. *Lœlias* require in summer only the ordinary temperature of a greenhouse, which in winter may be allowed to fall to 45°. The plant is of elegant habit with shining, dark green leaves, from one to three of which are produced on each pseudobulb. Immediately after the flowers have faded the roots will begin to protrude. An orchid will grow indefinitely in one direction if allowed, and the object of the cultivator is to produce "back breaks."

Mr. Rand said that he had been looking into the prices of orchids to ascertain whether they were a profitable investment from a pecuniary point of view, and had come to the conclusion that they were. In England, single plants had sold as high as two hundred and fifty guineas, though good specimens could be obtained at reasonable prices; that exhibited cost twenty-five dollars two years ago, and is probably worth three times as much now. Like pictures by the old masters, a fine specimen will always bring a good price. The colors of the *Lœlias* are white, purple, and pink in different shades, and there is not a poor species in the genus. He knew of no plant more desirable for cultivation, either by amateurs or for the sale of the flowers. He expected next Saturday to bring in a plant with a hundred flowers.

In answer to an inquiry, Mr. Rand said that back breaks were made by cutting the running stalk about three-quarters through, when a little bud would form at the base, which is afterwards separated. This is the method adopted by nurserymen for propagating. Another species is *Lœlia albida*, with white, fragrant flowers. Mr. Rand had received from Hugh Low & Co., Upper Clapton, England, ten plants of this species, the whole of which would not fill an eight-inch pot.

Hybridization is easily effected; the method is to lift up the top

of the column, and with a pair of pincers place the pollen masses on the stigma, when it instantly disappears. The orchids which have been most extensively fertilized in cultivation, are *Cypripedium*, *Calanthe*, and *Vanilla*. The fruit of the last has been produced in considerable quantity at Kew Garden.

Mr. Rand had had some of his orchids fertilized, probably by insects getting into the house, as very few fructify themselves. The *Lœlia* exhibited would require more moisture than is ordinarily found in the air of a greenhouse. The best plan would be to separate a portion of the greenhouse by a glass partition. His orchid house, although but twenty-five feet square, contained two hundred and fifty species.

Mr. Rand also exhibited a plant of *Cirrhopetalum Medusæ*, the generic name of which is derived from *kirros*, tawny, and *petalon*, a petal. The flowers are small, but so numerous in the spike, and two of the three sepals are so very much lengthened, as to give the spike the appearance of a head with long, dishevelled hair, whence the specific name. The bud comes up in a small sheath like the bud of a pink, and the flowers are twisted up very tightly. Being a native of Singapore it requires a great deal of heat and moisture. All orchids require good drainage and are impatient of sour soil.

MEETING FOR DISCUSSION.

SATURDAY, January 29, 1876.

The chair was filled by William C. Strong, Chairman of the Committee on Publication and Discussion, and the following paper on Wardian Cases was read by the writer.

WARDIAN CASES AND FERNERIES. I.

BY W. H. HALLIDAY.

Every one should have a hobby, says Prime in his preface to "I Go a Fishing." Mine has been, for a dozen years, Wardian Cases and Ferneries.

How I came by this hobby I am here at this time to tell you. Several years ago, looking over some books on floriculture, I came

across, in a volume then recently published, the engraving of a Wardian case. The description of this seemed to suit my fancy, as I wished to grow some plants during the winter months, and my former efforts in that direction had not been attended with very marked success. This seemed to promise better things, and I determined to give it a trial. The case I soon constructed, in the intervals of business, according to the book. This was my first attempt. I have had many more elaborate and beautiful ones since then, but this was the pet—the initial point, from which I have received so much horticultural pleasure.

Many articles have been written on this subject, by eminent English cultivators within four or five years, and it is now comparatively easy for a novice to gain all the information required, provided he has determination enough for any undertaking that will bring an occasional disappointment. But the chances of failure are so small, when one has started in the right direction, and the satisfaction of growing, in your own home, plants whose delicate forms and beautifully marked foliage are a wonder even in a greenhouse, is so great that it is surprising to me that all lovers of plants do not possess one of these little tropical gardens instead of the long drawn, sickly looking plants we see at windows, as we pass along our streets, that cost so much time and trouble in their cultivation. A well grown plant of *Maranta zebrina* is in itself a perfect picture of form and color, and the easiest thing in the world to grow in a Wardian case under proper conditions. Years ago there was a case with a plant of this kind in a window at the South End. The plant filled nearly the whole case, and looked so fresh and bright on a winter morning, that it always compelled me to stop and admire its beautiful foliage.

I propose in this article, not to deal in generalities, but to give, as nearly as my recollection will permit, a description of some of the cases I have had, with the plants grown in them, and my successes and failures during all these years, mentioning only the names of plants which I have actually tested.

I had two large windows facing the south, but a building obscured the rays of the sun part of the time. In the windows I placed two cases, each forty inches long, by eighteen inches wide; the box was six inches deep with an inner box fitting loosely to receive the soil; an inch moulding fitted around, projecting half an inch above the box, to receive the sash. The sash was on two

sides fourteen inches high, the ends solid, and the inside faced with mirrors. You will readily see that I introduced the mirrors to double the effect, and render the whole more beautiful. Upon this sash was a top ten inches high, sloping on the two sides, which fitted to and was kept in place by an inch moulding. This top could be removed to reach the plants, or tilted up a little if ventilation was desired. One of these cases I devoted to native plants, the other to exotics. I made many trips to the woods and my case of natives was soon in a prosperous condition. I filled it with all sorts of plants that happened in my way, among which I remember the blood-root, hepatica, trailing arbutus, pitcher-plant, lycopodium, *Mitchella repens*, *Polypodium vulgare*, and *Adiantum pedatum*. All these did remarkably well, but I found when winter came that many of them dropped off to sleep, and the curtain fell for the season.

In the centre of the tropical case a *Dieffenbachia picta* was planted; in one end *Maranta zebrina*, and at the other, *Ananassa sativa var.* These three plants, with some lycopodium and a few small ferns, soon filled the case, and it was quite successful. Some of the smaller plants had to be removed, as they did not thrive with the others. By the end of the summer the *Maranta* had quite outgrown its quarters, and had to be replaced with a smaller plant, and the same was the case with the *Dieffenbachia*. The latter seemed quite at home, each new leaf as it appeared becoming more beautiful, till the white spots had nearly crowded out the green, making a fine contrast with the *Maranta* on one side and the *Ananassa* on the other. This plant (*Dieffenbachia picta*) has never failed me, and I deem it one of the very best case plants. I noticed particularly the peculiar marking of the foliage coming out much more distinctly and beautifully than in a greenhouse. I cut this down when it had grown so large as to crowd the case, making a new plant from the top. The *Ananassa* proved itself a valuable acquisition, coming out in a beautiful rosy pink—a perfect blaze of color. This was more distinct and brighter than I have ever seen it since. As the winter approached, bringing its season of rest, the color faded to its ordinary hue. The next spring it again started with its rosy tint, and during the season fruited, and that was the end of it.

Having had such good success with these cases, I thought I would try one on a larger scale. The plan was soon in the hands

of the cabinet-maker, and in due time, made and set up in its allotted place. This was made very large, for an experimental case. Many of you will remember it, as it was exhibited in this hall four or five years ago, at the Annual Exhibition. It was nearly four feet square and stood six feet high from the floor to the top of the roof. The box stood two feet high, set on heavy casters, and moving on a pivot, so that it could be readily turned to the light as the plants required. The inner box was half an inch smaller than the outside all round, eleven inches deep, thoroughly covered with white lead paint, and perforated through the bottom with inch holes for drainage. The glass case, thirty inches high, fitted into a moulding projecting above and around the top of the box. The sash was made very strong, with iron braces set into each corner. Each of the four sides consisted of two panes of glass, two panes on two sides serving as doors. The roof was formed of four sloping sides, surmounted by a flat cap of wood, twelve inches square, tapering upward, with a turned point twelve inches high. This cap fitted on like a cover, and could be easily removed if necessary. The case was thoroughly painted with three coats of white lead, and cost, when completed, seventy dollars. It was as tight as ordinary fitting would make it, and in this condition was first planted. It stood before a large south window, receiving the sun several hours each day. In the bottom of the soil box, I placed small pieces of charcoal two inches deep; this was lightly covered with old moss to keep the drainage free; then I filled up the box with a compost of peat, loam, and sand. To give the case color, I placed in the centre a large plant of *Dracœna terminalis*, and near it good sized plants of *Pteris argyræa*, *Pteris tremula*, *Pandanus Javanicus var.*, *Maranta zebrina*, *Maranta sanguinea*, *Dieffenbachia picta*, and *Sanseviera Zeylanica*. This last named plant, I think, was the first one of the kind brought to this city. Two plants were given me by Mr. Irving, then gardener to Mr. Van Vorst, of Jersey City. The other plant I gave to the Botanic Garden. Mr. Irving also gave me a large plant of *Pothos argyræa*, which was trained up the sash and made a fine growth. A few small ferns and lycopods were put in to fill up the spaces near the glass. Altogether, the case made a fine appearance when planted, the color, form of foliage, and habit of the plants blending and harmonizing well together.

But after a while, the case did not work as well as I expected. The *Dracœna* grew brown on the ends of the leaves, and gradually the whole leaf decayed. The ferns did not do well at all, but damped off till I grew quite discouraged. I continued to replace the decayed plants by others, with no better results. I thought the trouble might be caused by want of heat, as the room at night and on Sundays, when I was not on hand to look after the fires, might become quite cool. With this thought came the idea of heating the case. I had made at the tinman's a small boiler holding a gallon of water; behind the case near the floor, I placed a gas jet, and over this the boiler, removing a panel from the box of the case, then fitting it so that it could be opened or closed at pleasure. The inner box, containing the soil, being eleven inches deep, left a space of twelve inches underneath; in this space I placed tubing enough to extend completely round the case, and to connect with the boiler outside. All seemed to work like a charm; a regular flow of hot water circulated through the case, but the gas was uncertain, having a strong inclination to go out occasionally, leaving a leaking burner so near the case that the plants suffered from it; consequently this was abandoned. I then went to work to ventilate the case, giving a little air at a time, till at last I removed the square of wood from the roof, and replaced it with a piece of plate glass, which I could remove wholly or in part, and this, with the aid of the panel which was opened for heat, furnished the means for ventilation. I soon saw that it was the one thing needed; everything worked well from this time. Occasionally a plant would become unsightly, and have to be removed; but on the whole it was a success. *Maranta sanguinea* became a beautiful plant; *Dieffenbachia picta*, a wonder in color; *Maranta zebrina* grew luxuriantly, its large velvety leaves attracting all who came into the room. *Sanseviera Zeylanica* made considerable growth, sending up several new shoots. *Pandanus Javanicus* did well through the summer and autumn, but damped off considerably in winter. My success with ferns was not so marked as in smaller cases by themselves.

The experience with this case convinced me that Wardian cases should be treated as miniature greenhouses, and that close cases might answer for some plants, but not as a rule to be generally followed. I have made many cases since this, and always constructed them on this principle. I would not accept a case as

a gift, unless it was properly drained and ventilated. I should feel quite sure of losing some valuable plant that might cause more annoyance than the expense of a case properly constructed. I do not think the shape matters much, so long as it suits the possessor, but a medium size is better than a small one, and easier to manage than a large one. Twenty inches by thirty, I think a very good size; not too large for most rooms, and large enough to grow good sized plants. The case I last exhibited here is of that size, and is my *beau ideal* of a perfect Wardian case. It is constructed of the best seasoned material, and though it was made nearly two years ago, and has since been in almost constant use, all the joints are as perfect as when it came from the cabinet-maker.

The following are the dimensions of this Wardian case: depth of table seven inches, made with an outside moulding to receive the sash. The turned legs are so morticed into the box that they are perfectly solid, and fastened *into* brass casters — the only proper way of putting on casters. The table, with the casters, stands twenty-eight inches high; a zinc lining closely fits the box, forming a lip round the moulding to receive the sash. This prevents water that happens to drip from the glass, or when watering the case, from coming in contact with the wood. A zinc tube passes through the bottom of the case for the purpose of drainage; within this, and less all around by a quarter of an inch, so that it can be easily removed, is a wooden box of half-inch stuff, also lined with zinc and perforated through the bottom with an inch hole. Across the outside of the bottom, on either end is a narrow cleat half an inch thick, so that the water in passing through can find ready means of escape through the tube. The sash has a circular top, the extreme height, thirty-three inches, coming on the side, instead of the end, producing a fine effect when the case is filled with plants. Each end of the top forms a quarter circle, which is hinged from the top bar, and can be opened to reach the plants, or to increase the ventilation. The corners of the sash are firmly secured with brass braces, so that no amount of dampness will affect it. In the bottom bar of each sash is fixed a slide five inches long by one inch wide, which can be readily opened when ventilation is necessary. There are six half-inch holes in the top bar, which are never closed. The method of draining this case was the same as that of the other.

For soil, I prefer good leaf-mould, mixed with sand. Masons'

sand is best, as it is coarser than the sand generally used, and it is more easily obtained. I use one-third sand and two-thirds leaf-mould, adding a small quantity of fine charcoal. I add the charcoal to keep the soil light and sweet. Peat is generally recommended for cases, but a good quality of peat is difficult to obtain, the article usually found being not much better than muck. George Such, of South Amboy, N. J., has the best, but it is not always easy to obtain it from him. My rule is, to mix the sand, leaf-mould, and charcoal together with water, wetting them thoroughly, but not so as to cause the mixture to adhere to the hand. When this is done the case is ready to receive the plants.

This case pleased me best when it was planted in the following manner: *Nephrolepis exaltata*, with its long, slender fronds occupied the centre, and around it were ranged in order *Pteris argyræa*, *Maranta pulchella*, and *Adiantum colpodes*. This last is truly a beautiful plant for the place, its long slender fronds giving it a fairy-like appearance, and imparting grace and beauty to the whole collection. A fine plant of *Adiantum formosum* stood opposite *A. colpodes*, its fine fronds shooting above those around it, rendering it conspicuous, and contrasting finely with the silver *Pteris* and the more rigidly exalted *Nephrolepis*. A good sized plant of *Fittonia Pearcei*, with its fine crimson markings, gave color on one side, while its silver leafed brother, *F. argyroneura*, was equally effective on the other. Besides these there were *Adiantum cuneatum*, also a good plant; *Onychium Japonicum*, when well grown, surpassed by few ferns in beauty, and eminently fitted for the place; *Selaginella Wildenovii*, one of the best of its kind; *S. stolonifera*, also a good case plant; *Maranta pulchella*, better than *M. zebrina* for a medium sized case, being dwarf in its habit, though not so finely marked, but forming a charming contrast to the delicate ferns. This made eleven plants in all—just enough to fill the entire case, while every plant showed its own peculiar form and character, and did not appear at all crowded. The tendency is generally to put in too many plants, giving the whole a heavy and unsightly appearance. The majority of people do not consider a case well filled unless it is crowded, but I think the grace that comes of lightness and individuality is much more attractive. In describing the position of the plants, I forgot to mention the cocoa-nut shell suspended from the top, containing *Adiantum setulosum*, giving completeness to the whole.

I have another case of smaller size, twenty-two inches by fourteen, convenient and not expensive, to be placed on a stand. This, in its general characteristics, resembles the larger one just described, having provision for complete ventilation and drainage, and when filled with the following named plants, makes a charming appearance: *Maranta pulchella*, *Adiantum cuneatum*, *A. setulosum*, *Pteris argyræa*, *Onychium Japonicum*, *Selaginella Wildenovii*, *S. Stolonifera*, *Fittonia Pearcei*, and *Latania Borbonica*. These plants were taken from three and four inch pots, and were quite large enough to commence growth in their new home.

Management of Wardian Cases.—This is the stumbling block which many find in the way; yet it is a very simple thing, provided the case is started rightly, with the kinds of plants suited to the season, and the position you intend the case to occupy.

We will here consider a case for winter decoration of a sitting room, which we will suppose to be warm enough for comfort during the day, and the fire not allowed to go wholly out during the night. We will suppose the case to have been planted as early as the first of September, so that the plants have had time to make considerable growth before the cold weather commences. All cases ought to be planted as early as this for the winter. It is generally supposed that Wardian cases require very little light; on the contrary, they need an abundance of it, but not necessarily the bright sunlight. Place the case directly in front of a window. I should prefer an eastern or southern exposure, as the sunlight is hardly powerful enough during the short winter days to harm the plants. We are now speaking of a ventilated case. When the case is exposed to the sun the ventilators should be open. Water should be given sparingly all through the winter. For this medium sized case (twenty inches by thirty), if in a warm southern exposure, use half a gallon of tepid water, once a month. If it has less heat and sunlight it will be necessary to give only half this quantity.

Be sure the soil is never muddy or pasty. If in this condition you will soon lose your plants. Look over the plants every three or four weeks, removing all unsightly or decaying foliage, and look carefully after the brown scale. This little pest has a particular fondness for some of our choicest ferns, and would soon render them unsightly if not removed. The slug is another source of annoyance, but watchfulness will soon discover the thief. We are almost certain to find him during the day under cover of some

leaf, coming out only at night, or during dark days. Some cultivators advise thoroughly saturating the soil with boiling water before planting the case, thereby destroying all insect growth. I have never resorted to this expedient, but think it would be advisable to do so.

In conclusion, to be successful in the management of our *winter garden* (which I think is a more suitable term than Wardian case), give plenty of light and heat during the day, the mercury ranging from 60° upwards, and not falling below 40° during the night; ventilate an hour or more each day, and do not give too much water, having it warm when applied. Much more might be said on this subject if time would allow, and other examples might be given of cases planted for summer culture. There is also much to be said about the arrangement and management of Ferneries which I hope to give at some time not far distant.

Discussion.

C. M. Hovey said that Mr. Halliday's paper was so full that it was, perhaps, hardly worth while to go over the ground again. As he says, the general management, in regard to air, watering, light, etc., is of the highest importance. The question is often asked of dealers, by purchasers of plants, how often to water. Beginners frequently water plants too little, merely sprinkling the surface of the ground, and the plants damp off, not from too much moisture, but from dryness; the collar, which should be dry is kept wet. Mr. Hovey hoped that Mr. Halliday's paper would lead to the cultivation of the plants which he recommended. A mistake made by novices in planting Wardian cases is to want them as full at the start as they should be after six months' growth. They want to see the ground covered immediately. Mr. Hovey said that he had read nearly everything that had been published on Wardian cases, and that this essay of Mr. Halliday's showed his familiarity with the subject.

The Chairman remarked that there were many beautiful plants and flowers on exhibition; among others, some forced lilacs, in regard to which the question had been raised whether or not they were the Persian lilac.

Mr. Hovey said that they were either the old lilac or some hybrid, and not the Persian. Mr. Calder who brought those ex-

hibited, had three rows in his forcing house. There is a great demand for forced lilac flowers. In Paris it is considered difficult to produce them, and the same with the lily of the valley. Lilacs require a very high temperature and darkness to bring them out early.

The Chairman said there were on the table some leaves of the white spotted *Richardia*, and asked whether it flowered as freely as the plain variety, commonly known as the calla.

Mr. Hovey had not found it as vigorous and productive of flowers as the common calla. It was valuable for planting out as a variegated foliage plant in summer. It was a summer bloomer, though not generally known as such. It might be taken up in autumn and treated like the dahlia, or it could be kept on growing in the greenhouse.

John B. Moore, who exhibited the *Richardia*, said that the flowers were about half as large as those of the common species, with purple centres. Reasonably strong bulbs grew pretty well with him. He was not aware that it was a summer bloomer, and had treated it just as he would a common calla, and they flowered freely. He turned them out of the pots and planted in a dry soil in the garden, and thought they did better than when dried in the pot.

Mr. Hovey said that the spotted variety has a greater tendency to rest than the plain. Like many other bulbs, it may either be kept in bloom or dried off.

Edward S. Rand, Jr. was called on for some information concerning the orchids exhibited by himself and others. The first of these was *Cattleya amethystoglossa*, and Mr. Rand said that this genus is one of the easiest grown, while the flowers are of brilliant color, many of them delightfully fragrant, and the plants of neat and compact habit. The species on exhibition is probably of Brazilian origin and had never before been shown here. It sends up a flower spike two feet or more in height; the flowers are large, of a rosy purple, spotted with dark purple and the lip of the same color. The culture which it requires is to have heat while in growth, to be kept rather dry, and to avoid wetting the leaves, never syringing. *Saccolabium giganteum*, an East Indian species, was also exhibited by Mr. Rand, the plant having two of its dense,

drooping spikes of flowers, like beautiful wreaths. It had been in bloom for ten weeks, having begun about Thanksgiving time. The flowers are deliciously fragrant. The plants may be brought into the house for decorating the hall or parlor, without injury. They have no fleshy pseudobulb, and must never be allowed to dry up, but require similar treatment to that of the *Vandas* and *Aerides*.

A fine plant of *Cymbidium aloefolium* was exhibited by James Comley. This is one of the oldest orchids in cultivation, having been introduced from the East Indies in 1790. The *Cymbidiums* are a very free flowering genus; this species is sometimes fragrant. Some of the species are very rare and costly, a hundred guineas having been paid in England for *C. eburneum*. Some cut spikes of *Dendrobium nobile* were also shown by Mr. Comley. This can easily be grown in the warm end of a greenhouse, where it will produce flowers by the hundred. The mode of propagation is to lay the stems in the warm, moist moss. Young plants will then form on the stems and can be separated and potted; indeed, they will often form on the stems when not laid down. It is also easily propagated by division. Mr. Rand said that he had propagated twenty or thirty in this way. He had seen single plants producing a thousand flowers each.

A. P. Calder, who exhibited the forced lilacs, having come in, was asked to give some information as to the variety and culture.

Mr. Calder said that the flowers were all the common purple lilac. Some of the bushes had been growing in his father's yard twelve or fifteen years. He planted them on the benches in the forcing house, some in the sun and some in the shade, just as it happened. The shade makes some difference in the size and shape of the flowers, but not in the color—more in the shape than in the size. Some have full formed flowers, while others have the lobes of the corolla narrow; the latter grew in the shade. Mr. Calder said he gave them a good deal of heat; they must have steady heat—if it falls they become checked and dwarfed. They must also have plenty of moisture. These plants were dug up at Christmas time and planted on the bench a week after. Last spring, after the frost came out and the lilacs began to start, he took up a plant and placed in heat, and in three days the flowers began to open. The color changed like that of the flowers exhibited, and the change was in both cases caused wholly by forcing.

Mr. Hovey said, in regard to time, that it had been stated that a certain amount of heat is necessary for the germination of seed, and if you distribute that amount over a long time you get no more result than if the same amount is applied in a few days. The lilac out doors begins to start about the first of April, and flowers about the first of June, requiring sixty days. Lilacs placed in a temperature of from 50° to 70° remained in the same condition for a long period. The effect of ordinary temperature is nothing, but 75 to 80° bottom heat, and a higher air temperature, would start the growth, and a decline would check it. It is the same with the lily of the valley; if once checked they cannot be started again. A temperature of 60° for thirty days makes a total of 1800°, and if you can give this amount in less time you will produce the same effect.

Marshall P. Wilder agreed with Mr. Hovey in his ideas of heat, and asked what was the shortest time in which he had known cuttings to root.

Mr. Hovey said that he had placed verbena cuttings in wet sand in a temperature of 80° or 90°, and they rooted immediately—certainly by the next morning.

Mr. Wilder said that he had rooted verbena cuttings handsomely in thirty-six hours, soon after hot water was first introduced for propagating beds, but not many plants root so easily.

The Chairman asked whether the time would not depend somewhat on the condition of the cuttings.

Mr. Rand said that he had rooted verbena cuttings so as to be fit to pot in three days, but, though this might be done in April, in autumn it would require thirty days. The lilac is grown in Paris in underground pits, in a great deal of heat. If we have two warm days successively in winter, newspaper editors immediately write on the danger of injury to the buds of trees, and friends are sure to bring in some swollen lilac buds. The lilac makes all its growth by the first of July, after which the buds for the next year's growth form and do not begin to grow until spring, but when we have two or three warm days in winter, the scales will swell and the buds show a lighter color. When it becomes cold again the buds return to their former condition. Plants know too much to put out before spring. There is no record of injury to plants before the first of March, but if we have a long spell of warm weather after that time, succeeded by severe cold, there is great

danger of injury. Mr. Rand thought the present winter, with the ground bare of snow thus far, would be hard on herbaceous plants. Many of that class which are tender here are hardy in Canada, where the ground is covered with snow. Alpine plants, which bloom on the edge of a snow bank, as soon as the snow has melted away from them, are destroyed in more southern climates, where they have not the protection of the snow.

Mr. Buswell asked whether the color of other flowers is affected like that of the lilac by forcing.

Mr. Hovey said the days were six hours shorter when these lilacs were forced than at the season when they bloom naturally, and in ten days they would then have sixty hours more sunshine than at this period of the year. They have not time to get their color in these short, dark days, but if grown slowly and if plenty of air were given, they would soon have more or less color. The same effect is produced by forcing on other plants; the Bon Celine rose, for instance, which, when forced at Christmas under a high temperature is almost colorless, or at least very pale compared with its brilliant tint in summer.

Mr. Wilder said that the whiteness of forced plants is owing to the absence of light, as in the shoots of a potato grown in a dark cellar.

Mr. Buswell remarked that the foliage of the lilacs on exhibition was of nearly as good color as if grown in the open air, and wished to know why that should not be affected as well as the flowers.

The Chairman said that these were not healthy and normal growths; the flowers did not draw their strength from the soil. The flowers resembled the Persian species.

Mr. Calder said that the lilac made no roots whatever in forcing, and more than two-thirds of the plants died after forcing.

Mr. Rand thought the plants died after forcing because no care was taken of them.

Mr. Calder replied that last year, after forcing, he transplanted nearly all his lilacs into the carnation house, and afterwards into the open ground, but the great majority died.

The Chairman thought the lilacs were like hyacinths and other bulbs that had been forced in water, sufficient vitality having been stored up in the plant to develop the flowers under a favoring atmosphere.

Mr. Hovey had never found any exhaustion of hyacinths by ordinary forcing. They would grow well enough but not flower,

except when they had been forced in a high temperature, when there was exhaustion because the foliage was not perfected. He thought that if Mr. Calder could place his lilacs, after a due season of rest, in a higher temperature than that in which they had been forced, he could excite them to growth. Plants after re-potting should be put into a bottom heat, and moderately watered and shaded to cause them to make roots. Plants are not exhausted by flowering, but by the high temperature, and it is so with the lily of the valley; he had planted them out, but found it difficult to get a healthy growth.

C. M. Atkinson said that in 1850 he succeeded Oldaker, who had been for twenty-five years gardener at Lord Sefton's, where they forced lilacs, cabbage roses, Anna Boleyn and pheasant-eyed pinks, etc. These lilacs had been there ever since Oldaker's time; some of them were grafted on ash and some on privet. They were forced by plunging in a mixture of fermenting material, and after forcing the old wood was cut back and they were planted out. If plants are cared for after forcing they can be preserved for many years.

The Chairman remarked that Mr. Hovey had said that the distribution of heat over a longer or shorter time in growing a plant made no difference, and asked whether the lilac flowers on the table indicated natural growth drawn from the soil, or from strength stored up in the plant and unnaturally developed.

Mr. Atkinson thought it difficult to answer this question decisively, but four weeks seemed to him a very short time to force lilacs into bloom. The French dig up large plants and force without foliage, and one would think this would injure them, but they renew their strength so as to force them again the third year.

Mr. Hovey read from the "Gardener's Chronicle," for January 8, 1876, an account of some experiments by M. Alphonse de Candolle, on the amount of heat required for the germination of seeds. "Mustard (*Sinapis alba*), germinated below 32° on the seventeenth day, and it is probable that this minimum might have been reduced still lower if it had been possible to keep liquid water around the seeds at 31.1° or 30.2°. Between 32° and 41° and 51°, each degree greatly accelerated the germination of *Sinapis*. Thus at 35.6° fifteen days elapsed; at 39.2° nine days. Afterwards the advance was more regular, but the rate of progress decreased gradually with each increment of temperature. Between 54°

and 68° the seeds invariably came up the second day. At 69.8° germination took place in less than a day — twenty-two hours. This was the most rapid rate reached. At 77° the rate slightly diminished, and at 82.4° only a small proportion of the seeds sprouted, and those at the end of the third day. At 104° not a single seed germinated.

The lowest temperature at which the seed of the Cantaloup melon germinated, was about 61.5° to 62.5°, more than nine days being required at this heat. From 66° the period was nearly uniform up to 75°, being three days. From 77° to 82.5° it slightly increased, as the seeds did not germinate till the fourth day, and this period was maintained with little variation up to 104°. At 105° one seed came up in ninety-four hours, that is, four days less two hours." The mustard and melon were quoted as examples of plants requiring, one a low, and the other a high temperature.

"Many other species tried, exhibited the same rapid increase at first, then uniformity during a long series of augmentations of temperature, succeeded by longer periods until the upper limit was reached. The seeds of *Collomia coccinea* offered a curious exception. They will germinate between 41° and 43°, but not readily except between the narrow range of 48° to 62°. Above this the heat becomes injurious to the species, and at 70° it took twenty-seven days, and with a greater heat the seeds did not germinate at all."

Mr. Hovey thought this statement a most interesting one. California seeds do not generally come up except in a temperature of about 43°, and at a few degrees above or below that point they do not germinate freely, corroborating the statement as regards the *Collomia*. He thought the principle established by these experiments would apply to plants as well as to seeds. If azaleas were placed in a temperature of 40° they would show no movement, but plants in a heat of from 65° to 80° had already done blooming. You will find that the amount of the temperature above 32° will produce nearly the same effect whether applied in two weeks, or distributed over two months.

The Chairman said that, admitting the correctness of Mr. Hovey's concluding statement, the important question is whether it is all the same to the plant.

James Cruickshanks related an instance which came under his observation in England, where a gentlemen was about to give a

large party, for which he wanted a quantity of mustard and cress. Two seed pans were sown at night and placed on the flue; in the morning the seeds were all started, and at night they had as much of each as was required.

C. H. Brackett was called on to give an account of his method of raising mushrooms, of which he had a fine dish on exhibition. He said that he had had good luck and did not expect to do so well again. He followed the directions given by Peter Henderson in his "Gardening for Profit," except that he did not cover with straw. He tried covering at first, but found that, in gathering, it disturbed the mushrooms. His beds had not been lower than 60° at night. Last year he attempted to raise them in a much higher temperature, and got but few.

Mr. Hovey said that here was another point in relation to temperature. He had also a dish of mushrooms on exhibition which had been raised in a temperature of from 40° to 45°. If they had had as much heat as Mr. Brackett's they would have been gathered by the bushel instead of the dozen, weeks ago. The bed was spawned October 2d; since then a new boiler, affording more heat, had been put into the house, and after that the mushrooms began to make their appearance. This confirmed the principle to which he had alluded. The more you force a plant the more you injure it for future usefulness. The lilacs mentioned by Mr. Atkinson were in pots, and not dug up from the open ground. He had forced the same deutzia plants successfully for seven years in succession, but not in a high temperature. The principle applies not only to the undeveloped plant in the seed, but through the whole of its life.

James Comley was asked to give his experience in raising mushrooms. He thought 60° to 70° the best temperature, with a bottom heat of 65°. A good bed, well made, would last about six weeks, but he thought them very uncertain. He had succeeded only two years out of five. His failures were sometimes owing to having poor spawn; he had had the beds a mass of spawn, but the mushrooms would not come for months. Last year he had four beds, each six feet by forty, and no mushrooms; other years he had got three hundred dollars' worth. He used to be troubled a great deal with insects, but watering with a weak solution of saltpetre would destroy them.

Mr. Hovey said the mushroom was "miffy." Fungi would grow under certain conditions, but within very narrow limits as to heat and cold, moisture and dryness. They will do pretty much as they have a mind to. If you can get the right kind of manure there is no need of spawn. He knew a gentleman who had fine crops produced spontaneously; the experiment was tried in the barn cellar, but one night the window was accidentally left open, and the temperature fell to 35° and killed all the spawn. Mr. Hovey said that he had raised mushrooms for six or seven years, and never failed to have a larger or smaller crop. His first attempt was most successful, as he had that year a large quantity of manure in good condition, from a large stable, which was much better than when only a small quantity could be collected at a time. Mushrooms cannot be raised very successfully in summer on account of the maggot; no insect troubles them in winter, but they are often eaten by the slug. He did not consider it on the whole a profitable crop.

BUSINESS MEETING.

SATURDAY, February 5, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President C. O. Whitmore in the chair.

The Recording Secretary reported that the notice of election of Recording Secretary, ordered for to-day, had been omitted by one of the papers, and that therefore no election could be legally holden to-day.

On motion of E. S. Rand, Jr., it was

Voted, That the Recording Secretary be ordered to give notice of an election of Recording Secretary for Saturday, March 4th.

The Committee appointed Dec. 19th, 1874, to obtain a portrait of the President elect, Francis Parkman, reported as follows:

"That exercising the discretion given them by the vote, they decided to obtain a bust rather than an oil painting, and accordingly gave the commission to Martin Milmore. The result of his

work is now here, awaiting your acceptance. Your Committee desire to congratulate the Society on possessing so faithful a memorial of a gentleman whose merit as a historian is known to thousands who are unaware of his valuable services to this Society, which are in this manner acknowledged.

C. O. WHITMORE,
E. W. BUSWELL,
WILLIAM GRAY, JR., } *Committee.*"

Charles M. Hovey announced to the Society the decease of George W. Pratt, and offered the following resolutions:

The Massachusetts Horticultural Society having learned with deep regret of the decease of their late member, George W. Pratt, it is hereby

Resolved, That in his death the Society has lost one of its original and oldest members, who not only was highly instrumental in perfecting its organization, but continued for a long period to act in various important official capacities, and particularly in the labor of inaugurating Mount Auburn Cemetery.

Resolved, That by the example of his personal efforts in the cause of horticulture, in the introduction, cultivation, and exhibition of new plants for many years, he has left a record honorable to himself and to our Society.

Resolved, That we tender to the family of the deceased our sympathy in their great bereavement.

Resolved, That these resolutions be entered upon the records and a copy sent to the family of the deceased.

Marshall P. Wilder, in seconding the resolutions, said that in the death of Mr. Pratt we had the satisfaction of knowing that he was not taken away prematurely, but like a shock of corn ripe for the garner. He was naturally a lover of the fine arts, inheriting his taste for horticulture from his father, whose garden, containing Brown Beurre and other pear trees, which would be recollected by many, was on the corner of Milk and Pearl streets, adjoining the mansion, which was afterwards the Pearl Street House.

Mr. Hovey said that Mr. Pratt was the first person to cultivate the dahlia in this country, when it was introduced in its single form.

The resolutions were unanimously adopted.

The Executive Committee, to whom was referred the resignation of Edward S. Rand, Jr., from the Committee on Publication and Discussion, reported, recommending its acceptance.

On motion, William C. Strong, D. T. Curtis, and Benjamin G. Smith were appointed a committee to nominate a candidate to fill the vacancy. The Committee reported the name of Rev. A. B. Muzzey, and he was accordingly elected.

N. P. Russell, of Boston,
Mrs. S. A. Holt, of Winchester,

being recommended to the Society for membership by the Executive Committee, were on ballot elected.

Adjourned to Saturday, March 4.

MEETING FOR DISCUSSION.

A meeting for discussion was held immediately after the adjournment of the business meeting, William C. Strong, Chairman of the Committee on Discussion, presiding. E. W. Wood read the following essay, which was illustrated by a diagram of a Ground Vinery, drawn on a scale of six inches to the foot.

Culture of the Foreign Grape in Cold Graperies.

BY E. W. WOOD.

The vine is the oldest fruit bearing plant of which we have any record. Frequent reference is made to it in Holy Writ, and its praises have been a prolific theme for writers through all time. So frequent and instructive are the allusions to vine culture in the classic poets that the college student, if he has scanned the subject, as carefully as the measure, of his Latin text, can hardly fail to possess an accurate knowledge of the peculiar soil, location, and treatment necessary for the successful culture of the grape. The vine is a plant of the greatest vitality; while it responds quickly and with great vigor to the careful and generous treatment of the intelligent cultivator, its wonderful recuperative powers are liable

to deceive the more careless and negligent grower as to the abuse it will endure, any injury not being readily perceived.

The grape is indigenous to this country, and in its wild state grows vigorously, often covering the tops of large trees and producing fruit abundantly; yet it is keenly sensitive to cold, and the wild fruit is not unfrequently destroyed by the September frosts. Except in peculiarly favored locations we are situated upon the northern limit where the grape can be successfully grown without protection, and here the earlier and hardier varieties, grown in vineyards selected with especial view to every advantage which location and soil can give, frequently prove, as last year, almost a total loss.

The frequent failures and disappointments with the grape in open culture during the past few years have led to a very general inquiry, "How can we protect and grow successfully the better varieties of grapes with the least care and expense?"

The object of this paper will be to answer this inquiry by inviting discussion to the construction of cheaper houses, and to less expensive management than is generally given to growing the foreign or exotic grape. The cultivation of grapes under glass is generally considered a work of much care and uncertainty, requiring the services of a skilful gardener; but I believe that from the amount of labor and skill often given to out-door culture, larger returns in both quantity and quality might reasonably be expected under glass. The roots of the Hamburg vine will grow in any place where those of the Concord will grow, and experience proves that, for cold house culture, the roots of one require no more protection during winter than those of the other. The tops only require protection, and as it is necessary to retain the light and to be able to increase and control the heat, houses constructed mostly of glass must be used. Grapes may be grown under glass with an aspect anywhere between east and west towards the south, but the form of house and aspect most favorable, is the common lean-to, facing south or southeast. As the heat in the house will be increased from ten to twenty degrees above that in the open air, it is desirable that the temperature of the ground in which the roots are growing should have a corresponding increase, and with a house facing due south, the border will receive the rays of the sun more directly and for a longer time, than in any other situation; while for the vines inside the house, the morning sun being more

desirable than the afternoon, a southeastern aspect would be preferable. The cost of a house will be considerably less if placed upon the south side of some building which may form the back wall of the vinery. In the front wall there should be a row of glass, in sashes from one to two feet in width, depending upon the size of the house, hung upon hinges to give circulation of air when the fruit begins to color. The roof should incline at an angle of forty-five degrees and should be of fixed glass, except a row of sashes at the top, the width to be in the proportion of one foot to every six feet of fixed glass.

Having secured the necessary protection for the top of the vine, in order to get the best results it will be necessary to prepare the border so as not only to furnish all the nutriment the roots can receive, but so that the soil and temperature shall be congenial and excite the healthy and vigorous action of the roots. The width of the border should equal the height of the front wall together with the length of the rafter inside the house, which will allow the same space to the roots that the tops are intended to occupy. The whole border need not be prepared when the vines are put out, as eight feet will be sufficient for the first two years, when more can be added as required. The whole should be thoroughly drained so that there will be no stagnant water either on the surface or in the soil. The border should be two feet deep above the drainage and should be composed of two-thirds partially decayed pasture turf and one-third stable manure, with which may be mixed, as a more lasting manure, broken bones and the hoof parings and filings from the blacksmith's shop. Unless artificial heat is to be used to force the vines the border should be entirely outside the front wall of the house, and the vines taken through directly under the sill.

With a house and border thus arranged, a full average quantity of Hamburg grapes, of superior quality, can be grown every year with almost unfailing certainty, without using water either inside or outside of the house. The use of water inside the vinery under careful direction in bright, sunny days, causing a warm, humid atmosphere, will produce more vigorous action and larger bunches of fruit; but in proportion as the size of the bunches is increased, is the fruit less evenly distributed over the vine, and, although by the use of water it may be stimulated as long as the fruit continues to grow, when it begins to take on color the water must be withheld, and the lower ventilators opened, giving a free circulation of air. The

vine, no longer sustained by an artificial atmosphere, fails to furnish sufficient saccharine matter to mature the fruit, and the result is often seen in large, imperfectly ripened bunches, while the smaller bunches upon the same vine will be well colored and of much better quality. In a house without water the labor is very much reduced and simplified, and the chance of failure very much lessened, as the imprudent use of water, or its use when not followed by sun heat, is liable to cause a sudden check to the tender growth, which is often followed by mildew, doing serious injury to both fruit and vines.

I need not stop to describe the internal arrangements of a house, as they are given in detail by all writers upon this subject, and substantially the same. The care given to the vines in a house when water is not used, is almost precisely the same as that given by amateurs in open culture, with the addition of giving air or ventilation whenever the sun shines.

From the time the vines are taken up in the spring till the fruit begins to color, air should be given by the upper windows only, which should be opened on fair mornings as soon as the temperature has risen from five to ten degrees with sun heat, and if the day continues bright they should be closed in season to retain a genial warmth before sunset. No rule as to the time for opening and closing a house can be given, as much will depend upon location. A house facing southeast will need to be opened earlier in the morning than one facing southwest, as the rays of the sun will fall more directly upon the glass, and for the same reason a house with a southwestern aspect will need to be kept open longer in the afternoon.

In starting a house, strong healthy vines, one year old, with tops at least six feet long, should be procured, and as soon as the border is in suitable condition in the spring the roots should be carefully shaken out from the soil and placed evenly on the border, one foot from the front wall, and covered with four inches of soil, and the vine passed through beneath the sill directly under the rafter. The earth should be pressed firmly upon the roots with the foot, and the tops tied up to or towards the rafter inside. If the buds all break, rub off all but the three lower ones. When they have grown to the length of two feet or more, and become strong enough to bear bending into position without danger of breaking, select the strongest and tie it to the wire under the

rafter. If the remaining shoots are below the one selected, tie them out to the side wires and cut them off twelve or fifteen inches from the cane. Cut off the old cane two inches above the base of the new growth, and two or three weeks later cut the snag away smoothly at its junction with the new growth. Tie the new cane to the wire loosely, allowing for future growth. Cut back the laterals, as they continue to grow, to the first leaf, saving two at the top in case of accident to the leader. The temperature of the house may be allowed to rise to 95° or 100°. With fair success the vines will make from twenty to twenty-five feet growth by the middle of September, when they may be cut back one-fourth their length, to ripen the lower portion of the cane. When the leaves have fallen, cut the canes back to three eyes, and before severe cold weather cover the small portion left with a piece of cloth or mat. Open the upper ventilators every day during winter when the sun shines; and during March and April, until the buds begin to break, open the house at top and bottom on bright days, keeping it as cool as possible. After the buds break keep the lower portion of the house closed. As the buds push select the strongest shoot, and when hard enough to bend without danger of breaking, tie loosely to the central wire, and if the other shoots are below the one selected tie them to the side wires and cut them off at twelve or fifteen inches from the cane. These laterals will show fruit, one bunch of which may be allowed to grow. The care the second season is the same as the first, with the addition of thinning the fruit, and as there is supposed to be but one bunch on each vine it will not be a labor requiring much time, but it will afford an opportunity for experience and observation, which, if improved, will be useful in the future. No rule can be given for thinning the bunches, as much will depend upon the varieties and the weather when the fruit is forming.

When the grapes are of the size of ordinary peas there will be more or less of them smaller than the average. Let these be removed first; then thin from the inside, preserving the full size and form of the bunch. When the bunches are large the shoulders may be tied at right angles with the bunch. It is desirable in thinning to leave just as many of the largest berries, evenly distributed, as will, when fully grown, fill the bunch out to its full size and make it sufficiently solid, without pressing, to retain its perfect form when cut and placed upon the table.

At the end of the second year the vines should be trimmed and cut back, leaving them one-third the length of the rafter. After this is done let them remain a few days, until the wounds caused in trimming become dry and hard, when they may be bent down in front of the sill, tied together and covered carefully with cloths or mats to shade them from the sun and protect them from extreme cold. Continue to keep the house well aired; open the upper ventilators whenever the sun shines during winter; and, towards spring, as the sun heat becomes stronger, give more air by opening the lower windows and the doors.

When the buds begin to push the vines should be taken up, tied to the rafter near the front wall, and the ends bent down near the floor, to check the flow of sap to the top and cause the buds to break evenly near the base. Let there be care and no haste in tying out the laterals to the side wires, as the tender growth is easily broken from the cane. When the woody fibre is formed and firmly attached they may be fastened loosely at right angles to the cane, and cut off from twelve to fifteen inches from the cane, according to the space between the rafters. If the vines are in good condition they may each be allowed to carry ten pounds of fruit. Train the leading shoot to the central wire as before. As soon as the fruit is formed remove all superfluous bunches, never leaving more than one bunch upon a single shoot. Cut in the side branches every two weeks, and when the fruit begins to color commence giving air at the lower windows, a little at first, increasing moderately as the berries make their last and most rapid growth, and when this is completed a free circulation of air may be given in bright days. At the end of the season the vines should be cut back, leaving them two-thirds the length of the rafters, and treating them as before during winter. The fourth year, if the vines are in good condition, they may be allowed to bear fifteen pounds of fruit each, and at the end of the season may be cut off at the full length.

To prove that a full average quantity of fruit, of more than average quality can be grown in the manner which I have briefly and imperfectly described, I will refer to a vinery upon the place owned and occupied by Mrs. Charles B. Shaw, in Dedham. This house, which is of unusual height, the rafters being twenty-four feet in length, was built, and the vines were planted in 1851. It contains eighteen vines, mostly Black Hamburg, Victoria Ham-

burg, and Wilmot's No. 16. The amount of fruit in this house from 1855 to 1875, has averaged between five and six hundred pounds, never in any year having fallen below the smaller amount, and in some years having exceeded the larger quantity. Fruit from this house was once shown at one of our exhibitions and received the Society's Silver Medal. This house was built by, and for twenty-four years has been under the care of Robert Watt, of West Roxbury, who has taken the vines up every season, tied out the side branches and kept them properly trimmed, thinned the fruit, trimmed the vines in the fall, and covered them for winter, at an average expense of less than twenty-five dollars per year. The only additional labor connected with the house has been to open and shut the windows, which has been done by the help employed upon the place. No water has ever been used in this house. No protection has been given to the border except to spread upon it a top dressing of manure after the ground had frozen in winter. I might refer to other houses in this immediate vicinity, conducted upon the same plan, with equal success, but the one at Dedham is the oldest of which I have any knowledge. For the benefit and encouragement of the ladies who may wish to engage in grape culture under glass, I am permitted to copy a few lines from a letter recently received from a lady in Portsmouth, N. H., who, having heard of Mr. Watt's simple plan of growing grapes, employed him, in 1867, to construct a house, prepare the border, and plant the vines. He recently wrote her, making some inquiries as to her success, and from her reply, I quote the following:

"In answer to your inquiries about my grapery, I am happy to tell you that the vines were planted eight years ago last spring, and I think I have had great success in growing grapes. They have been fairer and larger than any raised in town, gentlemen who have graperies being astonished at the size and flavor of mine. I lost no vines last winter; I have never used water in my grapery; I have never had any mildew."

I have endeavored to show that the care of a vinery may be made very simple, and that the labor can be properly done by any help competent to grow successfully the various fruits in the garden, and it may be claimed that if properly treated, no fruit can be more confidently relied upon for an annual crop. Yet no experienced grower ever uncovers his vines in the spring without a nervous fear that he may find a part or all of them winter killed,

and this fear is increased by the fact that the cause of the destruction is not well understood, some attributing it to extreme cold; others to the wood of the previous year not having been thoroughly ripened, and still others claiming that it is because the borders are not sufficiently protected. A sufficient answer to the last mentioned reason would seem to be the fact that the tops only are injured, the roots sending forth a new cane of strong and vigorous growth from below the sill. That it cannot be caused by extreme cold would seem to be shown by the fact that a greater loss does not occur in winters of extreme cold. A few years since, the thermometer in some places in this vicinity, dropped to twenty-six degrees below zero, yet there were very few if any vines killed that winter, while in the winter of 1874–5, without an extreme degree of cold, probably more vines were killed than ever before in any one year in this vicinity. Without presuming upon a knowledge which my limited experience would not warrant, I may give the results of my observations the past winter in my own neighborhood.

In the spring of 1871, three vineries were started, all near together. The vines were all planted by, and have been under the care of the same man during summer; they have had a uniform growth and appearance up to the time they were trimmed and laid down in the fall of 1874. In one of the houses the ventilators were occasionally opened during winter, and irregularly opened through March. In another the upper ventilators were opened every day while the sun was shining. In the third house the upper windows were opened every bright day in the earlier part of the winter, and after the middle of February, when the days were bright and warm, the lower windows and the door were opened. Upon taking up the vines in the spring every vine in the first house, eighteen in all, was killed down to the sill. Out of twenty in the second house, seven were killed, while not one of eighteen vines was injured in the third house.

This would indicate as the cause, the sudden changes of temperature, and especially would these be dangerous in the latter part of the season, when we have, as last year, an unusual number of bright, sunny days followed by cold freezing nights, and it would suggest as a remedy the careful covering of the vines, rendering them less liable to be affected by either heat or cold, and keeping the temperature of the house cool, and as even as possible.

To those who have limited grounds and cannot afford the room necessary for a house and border, or to others who cannot afford the expense necessary in the construction of a house, but who still desire to cultivate foreign grapes, the ground vineries afford an opportunity at an expense scarcely greater than that given to more hardy kinds in ordinary garden culture. These vineries, in substantially their present form, were introduced in England in 1860, by Thomas Rivers. They are miniature span-roof houses, those first used by Mr. Rivers being seven feet long, thirty inches wide, slope of roof twenty inches, and depth from centre of roof sixteen inches. These were placed upon a row of bricks upon each side for a foundation, and ventilation was given by leaving open spaces between the bricks; also by small openings in the ends near the ridge of the roof. The roots of the vine were planted at the end of the house and the top taken in between the bricks. Mr. Rivers soon found, as the vines gained in size and strength, that by leaving out the ends and connecting one house with another he could extend his vines indefinitely. After five years' experience he writes as follows, under date of September 8th, 1865: "A fine vine here of the Trentham Black Grape, occupies five seven feet lengths, and is of course thirty-five feet long. This is bearing fifty nice sized bunches of grapes, now fully ripe. Another vine, the Black Hamburg, is also bearing a fine crop of sixty-three medium sized bunches, the grapes full sized, finely colored, and fast approaching to ripeness. There seems to be a most agreeable and animating prospect of these neat looking and most useful structures occupying thousands of small gardens, and giving the luxury of fine, ripe grapes to many who are capable of appreciating and enjoying them."

These vineries have come into very general use in England, and I believe are even better adapted to use here than they are there, as the larger proportion of bright sunny days with us would be especially favorable for ripening the fruit in this class of houses. A neighbor of mine had some houses of this kind built in 1871. They were of the following dimensions: six feet long, four feet wide, slope of roof three feet, and depth in centre two feet four inches. The order for these houses was given to a carpenter who had had no experience in this work, and they were furnished at a cost of six dollars and seventy-five cents each. If any considerable number were wanted now they could probably be supplied for

five dollars each, and perhaps for less. These houses were put to different uses. In some were early vegetables, in others bedding plants, and in one were put two Black Hamburg vines. The house was placed in the vegetable garden, with one end towards the south, and the soil underneath and at the south end enriched with stable manure. The roots of the vines were placed in the soil outside the house, and the vines taken in and trained one upon each side of the house. They grew rapidly, but the house being so situated that it was inconvenient to join another to it, it became necessary to cut the vines off in the fall at the length of six feet. Before the ground froze the house was removed to the stable, and the vines covered with eight or ten inches of soil. They were found in good condition in the spring and were allowed to produce five pounds of fruit the second year; the third year fifteen pounds and ten ounces; and the fourth year fourteen pounds and two ounces. The same gentleman started several houses the past year with the intention of joining two together, allowing the vines to grow to the length of twelve feet instead of six, being fully convinced that this plan offers the quickest, safest, and most economical way of growing Hamburg grapes.

If a more general use of these houses fulfils the expectations which a limited experience seems to warrant, it will go far towards answering the question, "How can we grow successfully, with the least care and expense, the foreign grape?" It is a subject which interests every family, as there are few things that add more to the attractions or enjoyment of our homes than a liberal supply of the various fruits in their season.

Discussion.

Marshall P. Wilder said he was at Mr. Rivers' grounds in 1867 and had ocular demonstration of the usefulness of the ground vineries. The world owes a great debt of gratitude to him for this invention. Mr. Rivers, who is now more than eighty years old, has done more than any other man in England, for fruit culture.

The Chairman asked what objection there was to leaving cold graperies open all winter. His experience was that it might be safely done except in snow storms.

Henry F. French asked why it would not be beneficial to cover the vines with mats more closely than is usually done.

Mr. Wood replied to the Chairman that if it was certain the house would be closed in a storm it might be safe to leave it open at all other times, but one could only be sure this would be done by attending to it himself. If help were directed to close the house whenever the weather was cloudy they would do it, but if left to their discretion, it would be very likely to go wrong.

E. S. Rand, Jr., said that he had listened with great interest to Mr. Wood's paper, on a subject concerning which there had been a great deal of ignorance. He believed the cause of winter killing to be cold, dead air; it is almost impossible to heat it. The sextons of churches find it impossible to warm them, after they have been closed nearly a week, without opening the windows freely. There seems to be some peculiar property in confined air that causes winter killing in houses. He had given directions to have his grapery opened every sunny day, but not to let the air play through when severely cold.

P. Brown Hovey said his experience had been that there is no certainty in keeping grape vines over winter but by covering with soil. He would not have front ventilators. He had a house with front lights two or three feet high, which were opened in summer, and always had mildew there in spite of using the solution of lime and sulphur which was recommended as an infallible preventive. As the house grew old it settled, so that the front lights could not be opened, and after that he had no mildew, and found that it was caused by currents of air. He thought it best to keep the house dry and not to be always syringing, but would give plenty of air at the top.

Mr. Wood said that he did not open his front ventilators until the fruit had begun to color.

Mr. Wilder said that there was no danger of mildew after the leaf and wood had attained nearly to maturity.

Robert Watt said that he had been growing grape vines in this country since 1844, and though he lost some by bleeding, he had had none killed by cold until 1868. He had adopted the plan of leaving the borders uncovered until after they were frozen. He thought the winter killing was caused by the houses not being ventilated. Thomas Barrows' house was not opened from December to the end of March, and every vine was killed down to the sills. Thomas Liversedge had one house all killed and half of another one; neither of these houses was opened. Judge Reed's was

badly killed; Col. Lyman's and Mr. Stone's were all killed. Charles B. Shaw's, Ira Cleveland's, John Emmons' and Jeremiah Pritchard's houses (the last a span roof of one hundred feet in length), were properly aired and not a vine was killed. In 1875 nearly the same, and in some cases worse, results followed; H. A. Gane's, Mr. Barrows' and Mr. Stone's were all killed; Mr. Pritchard's were badly killed; Mr. Liversedge had one house killed and another not. It has been said by some that this winter killing was caused by badly-drained borders, but Mr. Liversedge's border was made by David Haggerston, and the vines were planted by him and Messrs. Quant and McLennan, and everything was done in the most thorough manner. No vines were killed there until 1868; and last year, when he was sick and unable to attend to the ventilation of the houses, more were killed. There was no indication of injury to the roots.

Mr. Watt said that he had made twenty-eight borders, and to show the manner in which they were drained, instanced Mr. Barrows', which was on a sidehill. Stones were placed under the border to the depth of from two and a half to three feet, to bring it to a level; then a covering of fresh turf with the green side down; then three feet of the top spit of a pasture, thoroughly mixed with one-fourth part of manure. The border was made in the fall, and in the spring the whole was turned and the vines planted.

Mr. Watt added that the later vines could be kept back in the spring the better. The earliest date at which he had commenced thinning was the 19th of June, and the latest the 14th of July. He had used no water in vineries for twenty-five years, though before he came to this country he never thought he could raise grapes without water. He used very little sulphur, and gave very little air. Mr. Rand's house had the least water of any house he ever saw, yet there was an entire absence of sunburnt leaves, which he had never known before. He agreed with Mr. Wood that the help must air the house, as the owners could not always be at home to attend to it. Mr. Watt spoke of a house in New York which was used as a greenhouse in winter and a vinery in summer, and answered admirably.

The Chairman said that he formerly had three vineries, each two hundred feet in length, which he threw wide open in fall, and left them so except in severe storms, the vines being covered with mats.

Charles M. Hovey expressed his dissent from Mr. Rand's views of the cause of winter killing, and said he would not like to have it go out from this Society that vines were killed by dead air. He asked whether the houses mentioned by Mr. Watt were treated the same in 1867 as in 1868, and if they were, why the vines were not killed in 1867 as well as in 1868.

Mr. Watt replied that the houses received the same treatment in both years.

C. M. Hovey said the vines were not killed by cold but by heat. Long continued sunny weather, when the house was closed, started the vines, liquifying the starch and sugar stored up in the wood; then very cold weather set in again, and two or three such changes killed the vines. It is well known that pelargoniums and many other tender plants will stand a single frost without much injury, but repeated two or three times it will certainly destroy them. Mr. Luke, a neighbor of his, who has a small grapery, always lowers two or three of the sashes of his vinery after pruning and laying down in autumn, and leaves them open all winter, keeping the house at a cool and even temperature, and he always has good grapes, as many can testify who have seen them exhibited on our tables. We have made no improvement, so far as good culture goes, in ventilation, over the old sliding sashes used in Speechly's time.

Eliphalet Stone said that the point we wish to ascertain is the cause of the loss of so many vines. Many of the houses mentioned by Mr. Watt were known to him. Mr. Hovey was right when he said that it was not heat or cold that injured vines, but the changes, and Mr. Strong was right in leaving his houses open. A cold grapery needs ventilation in winter as well as in summer. We trim our vines in autumn and lay them down to protect them from heat. Herbaceous plants out doors are destroyed by the heat of the sun in winter. Glass gives a tremendous heat in winter; four weeks ago a closed grapery would have been up to 125°. These vines are almost human, with every bud having a distinct individuality, and the heat of the sun sets the buds and the fertilizers at work. The tree is made up of cells filled with water and air; heating expands the cells and the vines are split. The reaction from heat to cold is the cause of the whole trouble. If you will ventilate your house in winter your vines will be safe.

Benjamin G. Smith said he had a duplicate of Mr. Luke's

vinery, and Mr. Luke had been his instructor in its management. From the 20th of June to the first or middle of August, he keeps the ventilators open day and night, excepting in heavy easterly storms. In winter he airs the house thoroughly, always keeping the ventilators down in the day time, except during severe storms. His house has no ventilators at the base. He covers the vines with mats.

C. M. Hovey said that Mr. Luke had never had a hired man to look after his house, though he is away at his business during the day, yet he raises good grapes. His house is no trouble whatever, for six months in winter. He agreed with P. B. Hovey, in regard to ventilation. He had been asked hundreds of times how to prevent mildew, and he answered that the house must not have a draft through it. The vines do not want to be in a draft any more than a man does. It is a very simple thing to raise good grapes, but it requires great care and skill to produce superior fruit, or such clusters as have been lately shown at Edinburgh and London, the Black Hamburg weighing twenty-one pounds, and being well colored, and the bunches of ten different varieties exhibited averaging seven pounds each. The Raisin de Calabre weighed twenty-six pounds and four ounces, and the vine produced another bunch of eighteen pounds, and two more of six pounds each. The White Nice weighed twenty-five pounds and fifteen ounces. These were forced grapes. The largest bunch ever raised in this country, so far as he could remember, weighed about seven pounds. Some of the best grapes he had ever seen raised in this country, were produced by Mr. Haggerston, when gardener at Mr. Cushing's, Belmont, and by J. W. Russell, gardener to the late Mr. Lemist, of Roxbury. He had seen these houses full of Muscat of Alexandria, Hamburg, and Syrian grapes, averaging two and a half pounds to the bunch.

The Chairman differed from Mr. Hovey, and did not regard these great bunches as results of the highest culture. He wished to hear from Mr. Watt concerning the quality of such grapes.

Mr. Watt replied that he would prefer bunches of from a pound to a pound and a half in weight to those of two pounds. He had never been able to color large bunches as well as small ones. The weather when grapes blossom makes a great difference. He would like dull weather for Hamburgs and fine for Muscats. He seldom saw a bunch with four seeds to a berry, and you cannot

get a large bunch without good seeds. He questioned whether the exhibitors at our shows could duplicate their bunches.

C. M. Hovey alluded to the bunch of grapes brought by the spies from the Promised Land, requiring two men to carry it. He did not believe they had a very dry climate where these were found. Grapes require water, but it must be given with judgment, and at the right time. When he read the account of the grapes of Eshcol he thought there might have been cultivators at that period who were in advance of some of those of our day.

Mr. Watt said that he had been at the horticultural exhibitions at Edinburgh, Glasgow, etc., and had seen as poor bunches shown there, even by Charles M'Intosh, as he ever had in this country. He had seen little stones hung to the ends of bunches to draw out their length. He had seen better grapes grown here than in the old country. And yet here we dig out a hole and fill with fertilizers for a grape border, while in the old country the graperies are built in the middle of the garden, where the roots can ramify at pleasure. The famous Hampton Court vine is believed to have sent its roots into the common sewer, and he had himself seen an instance when the roots of a vine had left the border and travelled through six feet of garden walk and seven feet of cobble stones, to feed on the decomposed manure of a hot-bed. If we made our borders wider and not so deep we should be more successful.

E. H. Luke said that he left his house open at the top, from the middle of June until the grapes were pretty nearly ripe, except in foggy weather. He had three lights down now, and they had been so all winter.

The Chairman remarked that Mr. Luke's and Mr. Smith's method of throwing the house open was almost as simple as out-door culture.

Hervey Davis said that he cultivated a grapery from 1862 to 1872, and never opened it in winter, and never lost a vine. They were laid down and covered with straw.

Mr. Wood said, in regard to ground vineries, that the vines in them required no more care than if trained on stakes in the open air. The vines are supported on crotched sticks, and the vineries are ventilated by a small triangular opening at the top of each end as well as by openings at the sides. Mr. Frost has had them in use for four years and has never had any mildew.

The Chairman said that the question is whether the ground

vinery or the common lean-to is the most economical. He thought a cheap lean-to would be, but Mr. Wood thought the ground vinery cheapest.

James Cruickshanks remarked that a good deal had been said about giving air in vineries in winter, and he regarded the practice as correct. He had always seen peach houses as well as grape houses left open after the fruit was gathered, and had shovelled out snow before preparing for forcing.

John B. Moore said that Mr. Frost began by making his ground vinery out of two hot-bed sashes, each six feet by three, such as are within reach of every one. They were fastened together at the ridge by hooks, and when the grapes had ripened could be piled away like any sashes, occupying very little room. Mr. Hovey had alluded to the improved methods of ventilation as being no better than the old, but Mr. Watt would tell us to use the modern style. To give it up and go back to the sliding ventilators would be like giving up the horse rake and going back to the hand rake. We must consider the great saving of labor.

MEETING FOR DISCUSSION.

SATURDAY, February 12, 1876.

William C. Strong, Chairman of the Committee on Publication and Discussion, presiding.

The Chairman remarked that in some respects it was unfortunate that our exhibitions had increased to such an extent that we lost their inspiring presence here, and yet he could not but congratulate the Society that the shows had grown beyond the limits of the Library Room. The display on this occasion was undoubtedly the finest ever made by the Society at this season of the year. Among plants particularly worthy of mention were the fine specimen azaleas shown by J. F. Rogers, Mr. Rand's display of orchids, C. B. Gardiner's prize cyclamens, and James O'Brien's beautiful table design.

The Chairman then called on Dr. G. F. Waters to read the following paper which he had prepared for this meeting, a portion of which, relating to his experiments in the improvement of corn

and the production of seedling peaches, is here presented in a condensed form.

Acclimating Plants.

BY G. F. WATERS.

It is well known that plants—I particularly refer to fruits, grains, and vegetables—have spread over the earth, and become able to endure great ranges of temperature, from circumscribed local beginnings. How that has been brought about is, with many, a mooted point. It was early observed that habits of growth corresponded with local conditions, and that those habits appeared to be fixed in each peculiar case. Improvement seemed for a long time to be the result of accident, or of culture applied for some other purpose. Very gradually, the food plants of the semi-tropical regions became inured to the temperate climates, changing their habits with changing conditions, until to-day the food plants of southern Europe are perfected in our less genial climate. When it was observed that nature gave to the seed of a plant which had been removed to a climate more or less favorable for its development, the power of imitating one whose period of growth would be somewhat conformed to the changed conditions, and that successive plantings secured perfect acclimation, a new impetus was given to acclimation, and change of aspect was soon found to be almost, if not quite, the equivalent of change of climate. When the causes operating to produce such results were considered, they were ascribed to the accidental sporting of seeds under improved culture,—to the tendency of vegetable life to be more excitable, and to come earlier into activity in a cold climate,—to a natural tendency of plants to adapt their habits or qualities to every climate in which art or accident might place them,—to the modifying power of climate over transmitted qualities or hereditary tendency,—to the tendency of a prolonged season to give more complete maturation; and, as the process of maturation must be reversed before germination can begin, it follows that those seeds which are gathered before they are quite ripe, will, when planted under favorable circumstances, germinate quicker than more thoroughly ripened seeds. It was also noticed that seeds planted as soon as ripe, germinate quicker than if allowed to dry before planting.

Whilst residing in Waterville, Me., I developed a variety of sweet corn, which acquired a very early habit. I commenced my experiments in the spring of 1855, on a lot which had been for two generations a garden, but for a few years previous had been abandoned to weeds. The soil was black and unctuous, consisting of decomposed slate, mixed with road wash. A dyke of hard slate, with a vertical dip, crossed diagonally from northeast to southwest, two feet below the surface, serving to warm and enrich the soil. The surface sloped gently to the southeast from the crown of the ledge, and was level north of it. A row of maples on the north side, and some large apple trees on the south, gave shelter. The ground was ploughed about the first of June, and a variety of sweet corn from the Patent Office, with large, shrivelled kernels, was planted just over the ledge. It received no dressing, nor any care beyond keeping down the weeds, and grew slowly until the last of June, when it took a start and grew with great luxuriance, bearing two or three ears to a stalk, and remaining green until the middle of October, at which time the kernels were very small and immature, but very sweet. The germinal part, the chit or embryo, was better developed than the food sac or endosperm, the kernels small, and the cob enormous. Being struck by hard frost, it was cut up and housed the third week in October. There were many stalks from nine to twelve feet high. The ears reserved for seed were hung away, and the remainder seemed to fill out after it was housed, so that the last cooking was better than the first.

The second year it was planted in well prepared soil, about the middle of May, a succession being sown until the first of June. After coming up a dressing of unleached hard wood ashes was given, and later an occasional application of liquid manure made from hen dung, between the rows. It was cut up the middle of September, four or five weeks earlier than the previous year, and found to be better filled out, and as it was planted only three weeks earlier, it had shortened its period of growth more than three weeks. Some which had been transplanted was much in advance of the rest and gave the first corn for the table. The ears marked for seed, by some mischance got into the pot, and the loss was not observed until killing frosts came, when the most promising of the second planting were selected. The kernels of this planting were not so well filled as the year before, and it oftener had twelve or fourteen rows than sixteen.

The next spring, 1857, some of the corn was sown in pots, to test its vitality, and about the third week in May transplanted to the warm soil over the ledge. A severe northeast storm checked it, but it recovered and spindled before the middle of June. The pollen was shaken over the silk many times daily. The cobs were short, ten rowed, and only fruited midway between the ends, giving a hint to take seed in future from the middle of the ear; indeed this course had been pursued in this year's planting. By the middle of July, it was fit for the table. The second planting ripened fully, and was used for seed the next year, because it had a shorter period from seed to harvest.

The next year the first planting was made the second week in May and was fit for the table the first week in August. The ears that first showed silk, where two grew on a stalk, were marked for seed. Few ears had more than ten rows, and many but eight.

The practice after this was to sow according to the Indian rule, when the leaves of the white oak were as large as a squirrel's ear, dressing the ground with hard wood ashes before planting, and during the growing season with the liquid hen manure. Soon after 1860 I left Waterville, and discontinued my experiments, which had resulted in producing an earlier variety than the early yellow Canada. This earliness was gained partly at the expense of size and quantity. In five years it shrank from sixteen to eight rows, while its period of growth was shortened from four and a half months to less than two and a quarter, and it has frequently been gathered for the table in sixty days from planting.

In 1866 I tried an experiment at Newton, Mass., in producing seedling peaches, from a small, hard, green, late, bitter variety, using chance fallen fruit that had been exposed to the frosts all winter; seven out of nine in the first generation bore fruit of fine quality, ripening early in August. Some peaches from one of these seedlings were presented at the exhibition of the Society on the 13th of August, 1870, and received the commendation of the Fruit Committee. The stones of these peaches were all small and without germinal parts.

It is understood that, in the germination of grain or seed, the food stored in the endosperm or cotyledons, for the young embryo to start with, must, if fully matured, undergo a change, the reverse of ripening, whereby it is rendered again soluble, and capable of being transported by the sap to the growing parts of the

young plant. It is also generally understood that heat and ferments produce this change. I think it may also be shown that frost assists, if it does not, in some cases, cause the change. It is not uncommon, in cold countries for the early snows to remain all winter, thereby preserving the ground from deep freezing, and from the effects of frequent thaws. Such a condition obtained with me one winter, while living in Waterville, Me., and a potato of the Peach Blow variety, that had been overlooked in the fall harvest, wintered in the ground and began to grow in the spring, breaking ground a week or more before it was thought proper to put in seeds. This plant grew more stocky and thrifty, than any potato I ever raised, of that variety, yielding many large tubers, much earlier than usual. It suggested an experiment, tried by me the next fall, with the Chenango. Preparing a trench, ten inches wide, by eight in depth, I put in the potatoes, covering five or six inches with earth, filling up the trench with corn stalks, and also making quite a pile of them above the surface of the ground. Late and light snows, frequent thaws and hard freezing, the mercury going far below zero many times that winter, wrought mischief with my experiment. As soon as the danger of hard frost had passed, I opened one end of the trench, to see how the potatoes had wintered. They were all soft and rotten. It being too cold to plant, the ground was left to dry and warm up. A few days after, I observed near this place, a hen pecking at something white as marble. I deprived her of her treasure, and taking some from the point of my knife, found it sweet like grape sugar, dissolving readily in the saliva, and seeming to leave behind no insoluble residüum. It was one of my fall planted Chenangoes, and its contents, starch, gum, cellulose, and water, had turned in the depth of winter, apparently, to glucose. But how? My mind went to work on the problem. It could not have been caused by heat, and, without that, ferment seemed out of the question. What other agent had been at work there? Frost, undoubtedly, had been there many times during the winter, but frost had no reputation for such work. It then occurred to me that potatoes cooked after freezing are sweet—sweeter than old, sprouted potatoes. After a second freezing, though said to be spoiled, they are sweeter and more glutinous. By a long application of heat, with acid or ferment, there is no difficulty in turning the entire potato to glucose, except perhaps, a portion of the water and the sulphur, phosphorus,

potash, and lime; the first two pass off mostly as odorous gases. How is it possible for frost to do this? Boiling with sulphuric acid at 213° ruptures the starch cells, sunders their contents, which changes to dextrine, and then to sugar. The same results are obtained by fermentation. We know that frost sunders the starch cells. The wilted condition of the once frozen potato evinces this, before we examine its contents. Who ever saw a mealy potato, when it had been frozen before boiling? It presents somewhat the appearance of one that has begun to sprout, but is sweeter and less firm, showing the effect produced upon the starch. Have we any other example of such work by frost? I recalled to mind that some seeds are said to germinate better, after exposure to frost, and that some will not germinate without such exposure. It is said that the office of frost, in these cases, is to rupture or soften the dry, hard pericarp, whose obduracy resists the warm rains and moist earth, sometimes for more than a year. But let the frost once exert its influence, and then, under a proper degree of warmth and moisture, the seeds show a celerity of movement only excelled by the progenitors of that troublesome insect the canker worm, under like influence. I had tapped my maples for sap, and the sugar came to mind, heretofore ascribed to the change in cellulose, starch, and gum by dextrine, heat, and ferment. But the sugar from the maple differs from the sugar of the potato, by the equivalent of one half molecule of water, and the potato has sixty-five per cent. of water to thirty-three or less, in the maple. Would that account for the difference in the sugars? "The first run of sap is sweetest." "The nearer the bark, the sweeter the sap." "The farther from the ground, the sweeter the sap." "Successive freezings give continuous supplies of sweet sap." All these aphorisms of the sugar camp went through my mind. But they proved nothing. They were only suggestive, and the conclusion was that frost at least assists, even though dextrine and ferment get the credit. A hard frost in the fall, by checking the process of maturation, if it does not turn back the starch and cellulose to dextrine and sugar, at least affects them in such a way that less work has to be done in the preparation for germination in the spring, so that the young plant comes earlier into activity, and with a richer or denser sap. A statement in one of the magazines, that frost killed some plants sooner than others, because of the difference in their density, due to the difference in the size of their

cells, set a young friend of mine, up in the hills of New Hampshire to thinking that, possibly, density of sap or cell contents would do as well, and he tried this experiment. In the fall, when the prospect was rain, with a strong probability that it would be followed by hard frost, he scattered over the ground, about some hills of potatoes, some soluble salts. In a few days came a rain, and that was followed in a couple of days by a frost that killed down all the potatoes, except those in the hills about which he had scattered the salt. His father observed the fresh foliage of these hills among the dead vines, and said he guessed they had mixed the seed in planting. My young friend writes, "I did not tell what I had done, fearing that the ultimate results of the application might be worse than the frost, and as we had a hard frost the next night, which they did not stand, I lost my experiment." Was he not right in his speculation? Frost injures plants by rupturing the cells, in the crystallizing of the contained water. Salt water, milk, and cider, do not freeze as soon as clear, fresh water; therefore, is it not reasonable to suppose that the young plant whose germination began under such favorable auspices, will be better able to resist the late spring frosts, and therefore to start earlier, and will give to its progeny a like habit? It is of the first importance that the young plant should be able to begin its work early in the spring, while light and heat are on the increase, as plants appear to grow under an increase, and to mature under a decrease, of light and heat. This influence, of increasing light and heat, is what gives to the morning sun its reputed value over the evening as a stimulant to plant growth. And that which is true of the day, in respect to the sun's influence, is true of the year. Hunt found by the use of glass of different colors, that cell growth was stimulated under yellow light, as we see illustrated in cloudy weather in the spring or summer; functional activity under red and blue, and maturation under violet. Gen. Pleasonton's experiments confirm Hunt's, particularly as to the value of the blue and violet rays in development and maturation. The violet are the most refrangible of the sun's rays, and the red the least. Owing to this difference of refrangibility, the violet and the blue rays strike the leaf more nearly vertically in the morning and evening, than the red rays, and hence the plant is more under their influence at those seasons, and this is the case in the fall, winter, and spring, for the entire day, while the sun is in low declination.

Doubtless, artificial heat, skilfully applied, as it is in the raising of plants under glass, may take the place of the less refrangible heat rays, to some extent, but not enough to prevent the plants from showing their appreciation of the increasing influence of the sun, as he starts on his northward journey about the last of December. The rigor of all northern climates prevent unprotected plants from showing their appreciation of this gradually increasing influence of the sun, till the amount of it has become sufficient to prevent hard freezing at night, and just in proportion as they have been prevented from yielding to that influence is their activity great; so by late planting, greater activity in early life is obtained, and the maturing effect of the gradual withdrawing of the sun's heat influence, and the increasing power of the violet rays bring the plant sooner to maturity, thus shortening its period of growth, and rendering its seed capable of coming earlier into activity, in the spring. If, to the sun's influence, there should be superadded that of the fall frost, checking maturation, and holding the food elements of the embryo where they are best fitted to be taken up in the spring, then we have seeds which will germinate still earlier, and thus will be longer under the accelerating influence of the increasing heat and light rays of the sun, and so, *will show better development than their progenitors, and as short a period.*

Discussion.

Marshall P. Wilder asked whether Dr. Waters' improved varieties were produced wholly by planting, or whether the scientific principles referred to were taken into consideration.

Dr. Waters did not think that acclimation could be accomplished with a single plant, but believed that it could be with a series, by repeated sowings of seed.

Charles M. Hovey said that he had been much interested in Dr. Waters' recapitulation of facts, but did not see their application to the acclimation of plants. There is much to be said on that point, but the improvement of plants is quite another thing. A society for the acclimation of animals and plants existed in Paris for many years, but still acclimation is a thing which has never been accomplished. The English climate is not warm enough to ripen Indian corn, tomatoes, squashes, melons, or cucumbers in the open air, under ordinary conditions. Mrs. Marryatt's gardener informed Mr. Hovey many years ago that he attempted the culti-

vation of Indian corn, near London, but without success. The *Rhododendron arboreum* was introduced into England from Nepal more than fifty years ago, and has been confined to greenhouse culture ever since, repeated sowings having had no effect in acclimating it. But after a time it was hybridized with the hardy American species introduced some years before, so that the progeny were half *arboreum* and half *Catawbiense*, and these seedlings were crossed again with the hardy species, making them one-fourth *arboreum* and three-fourths *Catawbiense*. By this process the deep, rich, superb colored flowers of the Indian species were finally combined with the hardy constitution of our American shrub; but the hybrids were tender exactly in proportion to the amount of Indian blood they retained. Canary birds have been bred here for many generations without the slightest effect in acclimation. Our summers, as well as those of Canada are as much tropical as those of New Orleans, enabling us to produce many tropical plants at that season in perfection; but this is not acclimation. Gladiolus bulbs may survive the winter when left deep in the ground, and covered so thickly with snow that the frost does not reach them; but they do not become acclimated, or at least they have not so far. Mr. Hovey agreed with Dr. Waters that frost has, to a great extent, the same effect on plants as heat. Seeds which require much heat to germinate will endure a temperature of—20°. He had had amaryllis seeds so exposed which came up better than those that had not been subjected to frost. Acclimation has been pretty thoroughly examined and discussed by scientific men, who have considered it a failure.

Mr. Wilder said that the reason why seeds plucked early germinate more freely, is that the pericarp is not so hard. He had been trying for forty-five years to believe in acclimation, and after spending much time and money in importing plants and endeavoring to adapt them to our climate, he had come to the full conclusion that the acclimation of plants in places not naturally suited to them is a chimera of the imagination. The human constitution will frequently endure the change of country and climate, but the extent to which plants can bear these changes is fixed by immutable laws, and all attempts to acclimate such as are not naturally congenial, will fail in the end, except within very narrow limits. Not, however, that a tree or plant may not sometimes endure greater degrees of cold or heat than it is subject to in its native

climate, but this is merely an accidental test of its endurance, and entirely distinct from what is commonly understood by acclimation. No one should suppose that time will produce a physiological or constitutional change in a plant. All the acclimation we can ever arrive at we must produce by the sowing of seeds, hybridized by the hand of man, or naturally cross-fertilized by insects or the air. Seeds produce a new being, and it comes down to this, that if we wish to acclimate we must do it by producing this new being. Some of our most tender fruits are from cold regions; the Black Tartarian, one of the tenderest cherries, for instance, came from the Crimea, while plants from warmer climates sometimes prove hardy here. He had tried experiments in acclimating plants at the expense of thousands of dollars, but without success.

Dr. Waters said it was hardly to be expected that the character of plants could be changed more easily than that of animals. They both begin life with certain tendencies, the development of which may be retarded or accelerated. In the first volume of the "Transactions of the London Horticultural Society," is an account by Sir Joseph Banks, of a successful attempt to acclimate the *Zizania aquatica* in England. The seed was procured from Canada, in 1791, and sown in a pond where it produced strong plants, which ripened their seeds. These seeds vegetated the next spring, but the plants produced were weak, slender, not half so tall as those of the first generation, and grew only in the shallowest water. The seeds of these plants produced others the next year sensibly stronger than their parents of the second year. In this manner they proceeded, springing up every year from the seeds of the preceding; every year becoming visibly stronger and larger, and rising from deeper parts of the pond, until 1804, when several of the plants were six feet in height, and the whole pond was covered thickly with them. In most cases where valuable results have been secured in the way of acclimation, they have been accidental. In England they do not attempt to produce Indian corn from their own seed. There they have a large amount of yellow rays, and the result is a great deal of coarse cell growth. If we attempt too much in the way of improvement there will not be time to develop seed from plants whose qualities were given in a climate with a long even season; the season with us is not long enough, and consequently, while the germ and cotyledons mature,

the fleshy envelop does not. If the germ is perfected you may, from that, obtain a plant which will require a shorter season for the perfection of its fruits.

Rev. A. B. Muzzey thought the Darwinian theory, though not to his mind fully established, gave encouragement to attempt the improvement of plants, and hoped that the remarks of the experienced horticulturists who had preceded him would not have the effect to deter our younger friends from experimenting in the direction indicated by the essayist. He thought there was much encouragement to do so, in the power possessed by the human race of adapting itself to all climates, and asked if this principle could not be carried over into the vegetable world, between which and the animal so many links have been discovered. He hoped that our friends would go on and experiment, and felt sure that, whether they succeeded or failed in acclimating plants, their experiments would shed valuable light on horticulture. Although it was contended by some that the climate was less favorable now than formerly for horticulture, he believed that it was essentially unchanged.

Mr. Hovey said he would not discourage young men from experimenting, but he had spent so many years in vain attempts at acclimation, that he would not like to have others lose valuable time in repeating them. It was well known that our cultivated strawberries include five distinct species, among which are the *Fragaria grandiflora* and Chili strawberry (*F. Chilensis*), natives of Surinam and South America. Before the introduction of these two species no very large strawberries were known, and it is their blood, infused into the native kinds by fertilization, that has given size to the large English strawberries, so well known, such as Myatt's British Queen, which has been grown to weigh two ounces. But this blood has given tender plants as well as large fruit, and though the British Queen, and others of the same class, no further removed by crossing, are still raised in England, they have all died out in our northern climate. Mr. Hovey received from a friend in Chili seeds of strawberries which he said were nearly two inches in diameter, but the plants raised from them gradually disappeared from the effects of our cold winters, until they were all dead. By repeated hybridizing this tenderness has been worked out and the size retained; but the acclimation of the species, or even of one or two removes by fertilization, has been a decided failure.

Mr. Hovey added that he imported many years ago, several dark red rhododendrons for the purpose of hybridizing and securing seed, but though they grew well enough in summer they died down every winter. He protected some of them until large enough to furnish seeds, but the plants raised from them all disappeared after one of our very severe winters. He believed in selection and improvement, and said that we must follow up improvement with regard to earliness, hardiness, and foliage. The province of the Society is to encourage improvement in the right directions, and not to follow the fallacy of acclimation. We should keep quite distinct the principles of *improvement* and *acclimation*.

The Chairman said that he had no facts to add to what had been stated, but he was very glad to listen to the particulars of the method by which Dr. Waters improved his corn. He did not agree with the sweeping assertion that there is no such thing as acclimation, and thought the orange tree and the Canary bird did not prove it. It is beyond reason to expect that such tropical products will ever adapt themselves to our climate. The question is whether there has been the slightest improvement, and he saw no reason why we might not witness some slight modification, as in the human race. Some things that verge upon hardiness may accommodate themselves to our climate.

Mr. Wilder thought that the progeny of species now verging on hardiness might adapt themselves, but said that the *Cryptomeria Japonica* and the *Sequoia*, which were almost hardy enough for our climate, gradually died out. Ellwanger and Barry had a clump of the *Sequoia* which formed the only exception to his statement with regard to that tree, that he knew of in the north. There are very few in Europe, and those at Rochester barely escaped.

The Chairman said that a single instance of successful acclimation would prove more than any number of failures.

Mr. Wilder had yet to learn of a single instance. If there had been one effected by the Paris Garden of Acclimation, he had never heard of it.

Edward S. Rand, Jr. said that his experience agreed entirely with that of Mr. Wilder and Mr. Hovey. He never had a single plant acclimated, and never knew the progeny of a tender plant fertilized by itself prove hardy, but if we could hybridize a hardy plant with a tender one, we should bend our efforts in that direction, and he cited as a most valuable result from such a union the

beautiful hybrid rhododendrons, which are perfectly hardy in New England.

Mr. Rand went on to speak of an orchid exhibited by him, which was received from Hugh Low & Co. for *Cattleya Trianæ*, but which he thought probably a hybrid between that and *Cattleya Mossiæ*, uniting the characteristics of these two beautiful species. This was only an example of what might be expected when we get to importing orchids in large quantities.

James Cruickshanks remarked that no one had yet succeeded in making *Epigæa repens* look well in cultivation. William Cobbett went home with the idea that he should have no difficulty in the cultivation of Indian corn in England, but though he started the seed in a hot-bed he only got ears of the size of his finger.

Mr. Rand said that he had been successful in growing the *Epigæa repens* in his rhododendron beds, but that Mr. Cruickshanks was right as to its culture in ordinary garden-soils.

MEETING FOR DISCUSSION.

SATURDAY, February 19, 1876.

William C. Strong, Chairman of the Committee on Publication and Discussion, presiding.

The Chairman announced the offer of the following prizes, of twenty-five dollars each. First, for the best Essay upon the Culture and Varieties of Roses. Second, for the best Essay upon the Culture of Flowers and Foliage for Winter Decoration and for Market, with a list of the most desirable varieties. Third, for the best Essay upon the Culture of the Squash and Melon, with a list of the best varieties. Fourth, for the best Essay upon the Ripening and Marketing of Pears. Fifth, for the best Essay upon the Improvement and Ornamentation of Country Roads.

No paper was provided to open the meeting, but the Chairman remarked that the many flowers on exhibition suggested much that might be learned. In particular, the very fine hybrid perpetual roses, exhibited by Mr. Comley, incited the wish to know

how they were grown, and he called upon Mr. Hovey for some remarks.

C. M. Hovey said that forcing this class of roses was no new experiment here, though few had been exhibited until last year. To force roses to advantage we must have plenty of room; it cannot be done successfully in the same house with a mixed collection of plants, though it may be with those which require a light temperature. The first point is the preparation of the plants; if this is attended to, and a proper temperature maintained, there is little danger of failure. Two essentials are plenty of water and manure. It may be said of roses, as a well-known English rosarian said of strawberries, that what they need is the pump and the manure pile. We have on exhibition to-day plants eight months from the cutting, with only one bloom on each. But it would hardly pay, in a commercial way, or scarcely in any way, to grow a plant so long for a single flower. To be forced profitably, or perhaps he should say to bloom profusely, the plants should first be grown two or three years in the pot or open ground, and they must have constant care, and never be neglected. They should be plunged in the ground during the summer, and in autumn taken up and the wood thoroughly ripened; otherwise they will not form their buds, but will run to foliage when planted in the heat. If the plants are turned out in the ground, the destruction of the root in taking up is too great. When brought into the house they must be kept in a low temperature at first, and not be allowed to grow too rapidly; a few degrees too much heat will ruin all that has been done. They must have plenty of air and water, and be kept free from all insects; and great care must be taken not to injure them in fumigating. They can be grown in the low houses commonly used for forcing, but higher and more airy houses are far better. Mr. Hovey said he knew a gardener, who had been very successful in forcing La Reine and other old varieties, who took up strong plants three or four years old, put them in ten or twelve inch pots, and placed them in a cool vinery, where the temperature fell nearly to freezing at night, giving plenty of air. Here they remained until the young shoots were two inches long, when they were removed to a warmer house to bloom.

E. W. Buswell said that he did not see the necessity for a plant to be two or three years old before forcing. He saw at Mr.

Comley's, newly imported rose bushes which were cut back very severely, potted, and placed in the potting shed. The next year very fine flowers were shown from these plants.

Mr. Hovey said that the plants might be forced when younger, or only one year old, but it would not be profitable to grow a plant for a single bud. The one great object is to have plants with many flowers, and this cannot be done on very young plants.

The Chairman remarked that the question was merely as to the quantity of blooms from a plant. The commercial growers pot their plants.

James Comley said the plants referred to by Mr. Buswell were one year old. Two year old plants would produce better flowers than three year old, but not so many.

Edward S. Rand, Jr., said that he had been quite successful in forcing roses, and that his method was very simple. He had a row of Gen. Jacqueminot growing in the open ground, which at Thanksgiving were taken up and put in his rhododendron cellar, which is kept just below freezing. At Christmas they were brought into the camellia house, and gradually to the warmest end of the rose bed. The plants were now in full bloom; he had had fifteen flowers on one plant; on larger plants he would get more bloom but not better. The plants were now two years old. After forcing he intended to take them up and plant out. He thought this the best way, though Mr. Hovey's might make better exhibition plants.

Dr. G. F. Waters said that the treatment of roses proposed is on the natural order. Success is due to close observation of nature. He had endeavored to set forth the natural method of forwarding the growth of plants. We must make our steps gradual, and, though we might make very little perceptible change, continued improvement would eventually give us a perfect plant. The plant of this year is not the plant of last year, but we have a new system built on the system of the previous year, just as in the development of a coral reef the polyps on the top are new individuals.

Mr. Hovey said that the great interest of these discussions is in the development of the principles on which horticultural operations are based. The Germans, who understand the principles of forcing, always have three houses for the purpose; the first kept at nearly freezing temperature, say 34° to 40°; the second intermediate, from 45° to 55°; and the third warmer, from 60° to 75°.

Amateurs who have but one house do not see the reason why they cannot grow plants as well as anybody. The secret of Mr. Rand's success is in gradually introducing the plants to heat. If too much heat is given at first the flowers will be small. These are principles underlying all the operations of gardening, and if we neglect them we shall fail of success. All forcing must be done gradually; the increase of temperature should be like the increase of temperature in spring, and if we examine the table in "The Garden Almanac," of the temperature of every day in the year, we shall see how very gradual this increase is up to the period of midsummer, and how equally gradual is the fall to midwinter. We must imitate this if we would not fail. We can cause melon seed to germinate in five days, or we can spread out the same amount of heat over ten days, or we can get a growth of cress in twenty-four hours, as Mr. Cruickshanks recently told us he had done, but the best results will be obtained by closely following nature.

Mr. Rand called attention to a plant of *Phalœnopsis Schilleriana* exhibited by him, one of the rarest and most costly orchids. It bore a fine spike of flowers, in shape resembling butterflies (whence the generic name), and of a delicate lilac or peach-bloom color. The genus includes eight or ten species, among which are *amabilis*, *grandiflora*, *grandiflora aurea*, *rosea*, *Lowii*, *Lüddemanniana*, etc., and is divided into two classes, the large and the small flowered. The leaves of the species exhibited are beautifully variegated with bars or spots of green and white, the under side being of a dark purple. This was the first orchid, with variegated foliage, known, except *Cypripedium barbatum*, and is the only epiphytal orchid combining beauty of foliage with beauty of flower. It makes two leaves a year; different plants vary in the marking of the leaves, and in purchasing a plant attention should be given to this point as well as to the flowers. The flower stem shoots up rapidly from the base of the plant. The plant shown is the first that has flowered in New England, but Gen. Rathbone, of Albany, has a plant five years old, with leaves nearly a foot long, and which had, at one time, a hundred and eighty-two flowers. It is a native of Java and Manilla, and not susceptible of cool cultivation. Many orchids, especially the Phalænopsids, keep on developing new branches from the flower stem, but the *Schilleriana* is an exception. It is very difficult to

increase, but Mr. Rand said that he should pin the flower stem down round the basket in which it was growing, and possibly new plants might develop from the nodes. Though the Phalænopsids are the most easily fertilized of all orchids, the attempts made in England to produce seedlings have failed, but in their native habitats they are produced so freely that the trees are covered with their beautiful wreaths of flowers. Under cultivation great care is required to see that the soil does not become sour. Mr. Rand said that he lost a large plant of *P. amabilis*, from the water lodging in the crown of the plant. The roots of *P. Schilleriana* are flattened, while most of the other species have cylindrical roots. Mr. Rand thought florists would find it profitable to grow this orchid, as single flowers would add greatly to the effect of bouquets. This plant had been in bloom for three weeks, and would probably continue for six weeks longer. *P. amabilis* flowers from November to May.

Mr. Hovey spoke of a plant of *Phalænopsis Schilleriana* which he saw in the fine collection of the late Mr. Lieneau, of Jersey City, with very beautifully variegated foliage, showing a great variety in the marking of the leaves of this magnificent orchid.

The Chairman thought we ought to appreciate the services rendered to horticulture by Mr. Rand in introducing and exhibiting these rare orchids.

Marshall P. Wilder said that it had often been his lot to introduce resolutions in honor of those whom we had loved in life, and to-day, he wished to pay respect to the memory of the ancient elm on the Common, prostrated by the gale on the evening of Tuesday, the 15th. Though it had lived to a good old age it had at last passed away, but if it could have spoken what tales it could have told of love and patriotism, and of gratitude for the land that we love!

Mr. Hovey said that the Old Elm Tree was associated with his earliest recollections; he remembered, when not more than eight or ten years old, being taken on to the Common on election day, and seeing the rows of booths, and crowds of people assembled, on the holidays of the summer, under the shade of this great tree. Before the young trees on the Common were so thickly planted he had seen this old tree standing alone with a hundred cows resting beneath its broad and shadowy branches. He had a great vener-

ation for beautiful trees, and though he had been obliged to cut down a great many, he never laid the axe to one without a pang of regret. Mr. Hovey alluded to the beautiful avenues of elms planted in Cambridge before the revolution by Mr. Inman, under which he had often reclined in a summer's day, and said that he had a tree on his own grounds for which he felt a great veneration. It was one of the only two living seedlings of the Charter Oak, and was brought to him forty years ago by the late Dr. E. W. Bull, of Hartford, in his carpet bag. If this veteran elm that has just fallen, could only speak of all that it has witnessed for two hundred or more years, what a record it would give! The memories which its fall brought before him were more than he could utter.

Mr. Wilder said that there was a young tree growing very near the roots of the great elm, and that it would be desirable to ascertain whether it was a seedling or a sucker. He suggested the propriety of planting, on this centennial year, a successor to the old tree.

Mr. Hovey thought it would be well to procure a portion of the old tree to make a chair for the president of the Society.

Hervey Davis said he had been informed by the City Forester that the young tree mentioned by Mr. Wilder is a sucker.

James Cruickshanks said that, though not to the manor born, he had a great regard for anything associated, like this old tree, with the history of the country. He lived in Hartford for three years and he now had a highly prized relic of the Charter Oak, and it was a remarkable coincidence that during the week when it was blown down, an oak in which the Scottish hero, Sir William Wallace, had taken refuge, was also prostrated.

Dr. Waters said that the development of a tree depends somewhat on the length of the season. When a tree gets so large that the sap has a great way to travel, the leaves at the ends of the branches do not, in a short season, have time to perfect by their absorbed and elaborated carbon a ground connection for the next year's sap to flow up through, so that no sap goes to those parts which have not had made for them such a connection, and consequently they perish. He thought that if this old tree had been headed in it might have endured for a century longer. Each living bud on a tree is the result of forces of the previous year, and is a possible tree. If the long, dying limbs are cut back to

where full, vigorous buds are developed, a new head will soon crown the tree.

Josiah Newhall said that in his mind there were many associations connected with the old tree. Long years ago there met under it some of the men who fought some of the hardest battles of the revolution, and there the subject of a monument on Bunker Hill was discussed. There he (Gen. Newhall) commanded one of the finest regiments in the state, which was reviewed by Gen. Lafayette. He hoped we might have some memento of the old tree.

Rev. A. B. Muzzey said that the loss of this old tree comes very near to our hearts, as it touches our patriotism, and we should consider, as a Society, whether we can do anything to preserve the lives of such trees. The Washington Elm, at Cambridge, lost a large limb some years ago, and though it has sent out new shoots its life is quite precarious. This tree is worth a great deal more than the old elm on the common, for here Washington first drew his sword as commander in chief of the revolutionary army. Mr. Muzzey said that he secured a portion of the broken limb, which he regarded as among his most precious treasures. A few years ago fears were entertained that the tree was near its end, and he asked whether any one could do anything to extend the term of its life.

Mr. Hovey did not agree with Dr. Waters in regard to lopping off large limbs, to resuscitate an old tree. Artificial culture requires the use of the knife, but it is a question whether all pruning does not shorten the life of the tree.

The President had requested him to say something of the azalea, of which we had many fine specimens exhibited. He called attention to a seedling of his own, a hybrid between *Azalea amœna* and *A. indica*, of very dwarf habit, resembling *A. amœna* in that respect. His object was to get a plant with the habit of *A. amœna*, and flowers as large and finely striped as those of *A. Indica*.

MEETING FOR DISCUSSION.

SATURDAY, February 26, 1876.

Rev. A. B. Muzzey, of the Committee on Publication and Discussion presiding.

The Chairman congratulated the meeting that, notwithstanding the severe weather, we had to-day, as on previous occasions this season, a very fine display of plants and flowers, and called on exhibitors for some account of their various contributions, and their methods of cultivation.

Marshall P. Wilder said that all his horticultural life he had been hybridizing the azalea and camellia, in the hope of producing improved varieties, and as he could not expect to remain here many years, he had been desirous to bring his seedlings into flower in as short a time as possible. Two years ago he promised to produce seedling camellias and azaleas, from seed then germinating, some of which should be in flower at this time, and now he exhibited two grafted azaleas, one of which was in flower, and the other would be abundantly in bloom another year, and an ungrafted seedling camellia, of the same age, in bud, besides a grafted specimen. Whether or not it would pay to take so much trouble to bloom seedlings early was not the question; his purpose was to show that it could be done. The stocks of the azaleas were the common *A. Phœnicea*. The seed was sown December 11, 1873, and came up in March, 1874, so that the flowers were produced in less than two years. Mr. Wilder said that he visited his greenhouse every morning, before coming into town, and again every afternoon, and saw that the plants were regularly watered and cared for. The cause of the early flowering is the grafting into older stocks, the principle being the same as is applied to the early production of new seedling fruits.

E. W. Buswell remarked that the Messrs. Clapp had caused their new seedling pears to fruit much earlier than they would otherwise have done, by inserting grafts from them in the branches of old trees.

Charles M. Hovey said that in dealing with all horticultural questions we must be governed by principles. It is not often that we see seedling azaleas brought into bloom in two years. They generally require from four to twenty years. He had a camellia from fifteen to eighteen years old, which only flowered last year—a very vigorous plant with fine foliage. He had raised a seedling rose from Gen. Jacqueminot, sowing the seed in December, and the plant flowering in May, though roses do not commonly flower under one or two years. One of the first persons to experiment in accelerating the production of seedling fruits and flowers was

the late Thomas Andrew Knight. He has recorded an experiment with a seedling camellia which grew very tall and vigorous without blooming, and which he bent down and twisted, and inarched on itself, for the purpose of bringing it into bloom, but without success. All trees, said Mr. Hovey, require a certain period of time to perfect a certain kind of sap. Some require more time than others, the Bartlett pear fruiting on young trees at four or five years from the bud, and on grafts in old trees in two years, while the Dix requires fifteen or twenty years to commence bearing, and then gives only a few pears from the top of the tree, and does not come into full bearing until about five years later. The Harvard requires about twenty years, and the Urbaniste from fifteen to twenty, except when grafted on the quince, which acts on it like premature old age. The plan adopted by Col. Wilder was attended with too much labor and expense to be carried out on a large scale. It would not pay nurserymen to graft five hundred azaleas to accelerate their bloom, the greater part of which must be thrown away as worthless. His method was to winter the plants under the greenhouse stage, placing them out doors in summer. Inarching requires much room and considerable care, and is now seldom practised, grafting the young wood being substituted. When plants are forced by using manures or fertilizers, in any considerable quantity, to accelerate the growth, the flowers are injured in form and substance.

Mr. Wilder said that Mr. Hovey had stated very clearly the principle that maturity is requisite to enable a plant to produce flowers and fruit. Nevertheless, Mr. Knight was mistaken in the opinion that a graft could not be made to produce fruit before the seedling from which it was taken, as we have proved over and over again. He agreed with Mr. Hovey as to the economical principle involved in his experiments, but he was desirous to see, as early as possible, whether he had among his seedlings anything better than we previously possessed.

Mr. Hovey said it was well to bear in mind that it had been taught that plants raised from cuttings, a process analogous to grafting, would not produce flowers sooner than seedlings, but this was disproved by Dr. Dix, who raised a double white camellia from a cutting. Some of Mr. Hovey's seedling camellias, the Anne Marie Hovey and C. M. Hovey for instance, were from five to ten years old before flowering. The tops of the young plants

many years ago, when grafting was not as well understood as now—before we had studied the works of the French, who have carried the art to such perfection—were inarched on old plants. Now he has cuttings blooming in from two to three years, as quickly as a graft and even earlier. After a time, cuttings from old plants seem to retain the properties of the old plants.

E. S. Rand, Jr., said that the only seedling azaleas he had raised were hardy varieties, which flowered in eight years from the seed.

Mr. Rand exhibited a plant of *Odontoglossum pulchellum*, and said that the different species are natives of the cool slopes of the Andes, where at night frost not unfrequently rests on the leaves, some being found at an elevation of 10,000 feet. When first discovered, the plants were carried to England by the ten thousand, but probably not one of those imported from 1830 to 1835 is now alive. They were destroyed by being subjected to the same heat as East Indian orchids. The great difficulty in growing them here will be the heat of our summers. They may be grown in a greenhouse where the temperature falls to 45° at night, along with pansies and camellias. As each pseudobulb, of the species exhibited, annually produces two, it is rapidly propagated. Its season of growth ends in August, when it should be kept dry until December and afterwards kept cool. The plant shown had been in bloom for five weeks, and had been kept in the hall of Mr. Rand's dwelling house, where the temperature fell to 45° at night. The flowers are fragrant and graceful, and might be profitably cultivated by florists, as they can be grown as easily as the lily of the valley.

Mr. Hovey exhibited specimens of the fruit of *Eugenia myrtifolia*. He stated that it was a very ornamental plant belonging to an important genus, of which the common allspice, *E. Pimenta*, is a species. The fruit is eatable and quite pleasant, forming an agreeable variety for the table. The fruit of *Eugenia Jambos* is larger and more eatable. All the species are beautiful plants, nearly related to the myrtle, and resemble that genus both in foliage and flower. The flowers of *E. myrtifolia* are borne in profusion all summer, and though it would require many plants to produce any quantity of fruit for eating, it is borne so abundantly as to be very ornamental on the tree. When pinched into pyra-

midal form, like the azalea, it makes a very handsome plant, and is so hardy that it might almost be kept over winter in the cellar.

The effect of the winter just past, on fruit and other trees, was then brought up, and in answer to an inquiry whether any observations had been made on this point, Robert Manning stated that he had examined some peach buds, which, near the base of the shoots, appeared entirely uninjured. Those on the upper part of the shoots exhibited a general discoloration, but none showed the distinct black speck which is so well known as indicating the destruction of the embryo. Some persons held that whenever the mercury fell to —10° the peach buds were all destroyed, but though his thermometer had marked —12°, he thought a sufficient number of the buds were uninjured to afford a good crop of fruit.

Henry F. French said that A. J. Downing stated many years ago that peach buds would be destroyed whenever the temperature fell to —10° or —12°, but he had often observed that they survived a cold of —20° to —25°. In a dry soil the growth stops earlier and the wood ripens earlier, and hence is less liable to injury. Mr. French asked whether any one could account for the bursting of apple trees. He thought it might be caused by the freezing of sap. It is well known to wood choppers that trees do freeze to the heart in severe cold.

Mr. Wilder said that fruit trees in his ground split open in consequence of the severe cold the last of November, 1875.

Mr. Hovey said that in the winter of 1856 and 1857 the thermometer fell to —20°, and pear trees were injured both in the bud and wood, while most peach buds were uninjured. Much depends on the condition of the tree, as well as the severity of the cold, both preceding and succeeding zero weather. When peach buds are killed, the cause may be found in some peculiarity of the winter. Trees will often resist a single freezing when they cannot survive two or three. Azaleas when frozen may be recovered by careful treatment, thawing slowly and in the dark, but if frozen a second time the plant will be severely injured or destroyed. Sometimes the temperature falls to —15° or —20°, followed by a mild rain, and a second or third change to zero destroys the fruit buds. The sap appears to be liquefied by the heat, and the succeeding cold acts mechanically and splits the trees. Mr. Hovey instanced a row of lime trees on Boston Common, which in

winter crack open to the width of from a quarter to half an inch, but close up again in summer. The wood of this tree has large, open vessels. He had observed a remarkable difference between the abele and the white maple during winter. While the buds of the latter swell in warm weather and contract on the return of cold, those of the former continue to grow larger and larger, indicating continuous root action. We know that the catkins of the hazel frequently appear in November. These facts indicate that something is obtained from the ground even during the most severe weather. Mr. Hovey did not know why root action might not go on even when the ground was frozen. It had been thought that rhododendrons were injured by excessive evaporation during very dry weather in March, accompanied by high winds when the ground was frozen, so that the roots were unable to make good the loss of moisture sustained by the top. But this is merely supposition and has not been shown by careful experiment to be true. There can be little doubt that there is a movement of sap throughout the entire year.

The Chairman suggested the subject of Noxious Insects as important and interesting for discussion at a future meeting.

BUSINESS MEETING.

SATURDAY, March 4, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President Parkman in the chair.

This being the time ordered for the election of Recording Secretary, the Recording Secretary announced that the notice had been duly given, and on motion the polls were opened at five minutes past eleven, to remain open thirty minutes.

The Executive Committee reported the acceptance of the resignation of William Gray, Jr. as Chairman of the Committee on Gardens. On motion C. M. Hovey, William Gray, Jr., and John G. Barker were chosen a committee to nominate a candidate to fill the vacancy in the Garden Committee.

Henry W. Putnam, of Salem,
Samuel W. Twombly, of Winchester,
D. L. Milliken, of Maplewood,
James Lawrence, of Groton,

being nominated to the Society by the Executive Committee, were elected to membership.

The polls for the election of Recording Secretary were closed at thirty-five minutes past eleven.

The Chair appointed C. M. Hovey, J. W. Manning, and William H. Spooner a committee to count the votes. The Committee reported the

Whole number of votes, . .	41
Robert Manning had . . .	40

and was elected.

Marshall P. Wilder, Chairman of the Committee on the Centennial Exhibition, reported that he had been in correspondence with the authorities of the exhibition, to establish the number or quantity of specimens which should be exhibited of the different kinds of fruit, and that until this point was fixed, which he trusted would be soon, the Committee would be unable to issue their circular inviting contributions.

Meeting dissolved.

No separate meeting for discussion was formally organized, but while waiting for the closing of the polls Charles M. Hovey exhibited some seedling azaleas and made some remarks in continuation of the subject discussed the previous week. One of the azaleas was a seedling six inches high and just two years old, showing a single flower, while a smaller plant of Bijou de Paris was raised from a cutting, and bore a flower. Mr. Hovey said that he commenced raising seedling azaleas in 1835, and since then had raised them in large numbers, and that as a rule seedlings did not flower near so early as grafts or cuttings. These azaleas were of the *Gledstanesii* or *lateritia* type; while those shown by Mr. Wilder, the previous week, were of the *Phœnicea* type. We can see no reason why a seedling plant should not come up and bloom immediately, but experience shows us that it must arrive at the age of puberty, and that it requires the formation or storing up of a peculiar kind of sap.

Mr. Hovey also exhibited a camellia cutting two years old, in flower, taken from an old plant, and confirming the inference drawn from the azalea cutting, that by propagating from cuttings of old plants we can accelerate the production of flowers. It is a great satisfaction when we can accelerate the flowering of seedling plants, so as to judge of their merits earlier.

Marshall P. Wilder exhibited a flower of azalea Marie Le Febvre, and said it was remarkable how from the original *Azalea Indica* such large flowers as these were produced. The first importation was *A. Indica alba*, and the wonderful development that had resulted from it by hybridizing, was the strongest inducement to continue the practice. We get such things by hybridizing, as Nature herself never thought of. He did not believe that Adam in Eden had such flowers as these. He began low down.

Mr. Hovey said that once in a while Nature steps in and produces something surpassing all that man can accomplish, and instanced the Duchesse d' Angouleme pear, which was found growing wild in a hedge in France. In such productions Nature seems to surpass herself.

Mr. Wilder did not believe that the Duchesse d' Angouleme pear grew up without being naturally impregnated by the bees or wind, or that Van Mons could have practised on his own theory, for natural impregnation would continually have interfered with it.

Mr. Hovey remarked that Darwin was not the first to suggest the theory of selection, for Dr. Van Mons' theory was essentially a theory of evolution and development.

Dr. G. F. Waters expressed the opinion that the small size of the pots had something to do with the early flowering of the azalea and camellia exhibited.

Mr. Hovey said that the smaller the pot, consistently with the health of the plant, the sooner the plant would bloom. To cramp the roots, without stinting, brings early maturity, like the quince stock, where the sap vessels are smaller than those of the pear graft, causing an enlargement just above the point of union. Precisely the same effect is produced by ringing, but he had noticed that when a branch of the Dix pear, which is noted for its late bearing, was girdled to cause it to produce fruit, it seemed to grow over more rapidly than other varieties. In producing seedlings he had always acted on the principle that checking the growth of

the plants by keeping them in a small pot, has a tendency to cause them to flower at an earlier period.

Mr. Hovey spoke of the clematis as deserving more attention than it had received here, and alluded to the *Jackmanni* type and other improved forms which have recently been produced in Europe. *Clematis Fortunei*, a double white variety, had flowered and produced seed abundantly with him, and a specimen of the progeny was exhibited. It had a lavender colored flower with seven or eight petals, resembling the original type. He thought we could produce varieties here as good as the improved European kinds, such as *Rubella*, *Jackmanni*, Prince of Wales, etc.

In answer to an inquiry by Henry F. French, Mr. Hovey said that the habit of the flower exhibited was the same as that of our native species; it is hardy and grows rapidly.

J. H. Woodford asked how long the seed was in germinating.

Mr. Hovey replied that it was sowed as soon as ripe, in August, and some germinated in January and February, while others laid in the ground a year before the plants came up. It was planted about three years ago.

President Parkman said that some species take longer to flower than others. The specimen exhibited seemed to have returned to the *patens* type, but to have inherited from its parent a tendency to come double. He thought the single varieties more beautiful than the double. He had raised a large number of seedlings, and in England so many had been raised that the market was glutted, a single nurseryman having received from the originators two hundred new seedlings. Sometimes, however, we got something so superior that it is worth while to attempt raising seedlings. *Clematis Jackmanni* was a cross of *C. lanuginosa* and *C. viticella*—the latter having a smaller flower with four petals, and in some of the varieties being very dark colored. One of the best of these varieties is *Hendersoni*, which blooms freely and is very hardy, and was probably used by Mr. Jackman to cross *C. lanuginosa*. *C. Jackmanni* sometimes comes with four petals like, *C. viticella*.

Mr. Hovey remarked that the varieties with but four petals, though producing a fine effect in a mass, were not so beautiful as individual flowers, and we should now, with improved sorts, reject those with only four petals, unless remarkable for color, and retain those with five, seven, eight, or nine petals, which are circular in form, and beautiful as single flowers. He sowed the seeds in a

pot and placed them on a shelf in the propagating house or under the stage till they showed signs of growing. Many seeds were ruined by alternate drying and watering, causing them to rot. They should have moderate and even warmth, and never be very wet or very dry. Seeds of lilies kept in an even temperature in a cool shady place, come much better and more regular than when exposed to alternations of heat and cold or wet and drought.

MEETING FOR DISCUSSION.

SATURDAY, March 11, 1876.

William C. Strong, Chairman of the Committee on Publication and Discussion, presided, and congratulated the meeting on the beautiful exhibition in the hall, which could not but be an incentive to others to cultivate such flowers. He felt confident that the public would catch the enthusiasm in floriculture, which led to such increasingly beautiful exhibitions. In the absence of any special essay, he called on the exhibitors to say something of their various productions.

Marshall P. Wilder, alluded to the many beautiful azaleas exhibited by himself and others, and said that perhaps no plant had been improved more than this. The improvement was due to a knowledge of cross fertilization, bringing together the best parents so as to produce not only beautiful flowers but plants of good habit. A plant with gross foliage and robust habit, but diminutive flowers, presents an incongruous appearance. In crossing, we should select varieties possessing the characteristics that we desire to combine. The camellia has been equally improved with the azalea. Mr. Wilder thought there was a point beyond which we could not go in improvement, and that we should never see any finer flowers of the camellia and azalea than now exist, but there were a multitude of other things that could be brought up to the same standard, and we may see other forms of flowers and expressions of color in those species which have been most improved by art.

The Chairman said that the attention of every one entering the

hall would be arrested by the stand of perpetual roses exhibited by James Comley, and he had no doubt that it was in the mind of many gentlemen that they would cultivate perpetual roses. So many of the contributors of flowers remained in the hall that it became a question whether we should not be obliged to follow the exhibition to the other room. He wished that Mr. Comley were present to give us some information concerning his method of forcing roses, but as he was not he called upon C. M. Atkinson to tell us something about a plant of *Thyrsacanthus rutilans* exhibited by him.

Mr. Atkinson said this plant belonged to the order *Acanthaceæ*, and was introduced from South America about twenty-five years ago. It is a half shrubby plant, producing great numbers of brilliant crimson, tubular flowers, attached near the ends of long, slender, branched, drooping flower stems, giving the plant a very graceful appearance. It is propagated by cuttings, and is one of the most easily cultivated of warm greenhouse plants. It requires a temperature of about 50° at night, and plenty of water. He had found it very useful for table decoration, the trusses of flowers being so arranged as to droop from the cups of a branching flower stand. The plant exhibited had been in flower for three weeks, and would continue certainly a month longer. It was about twelve months old and four feet high.

Mr. Atkinson also exhibited a branch of *Philadelphus coronarius*, in flower, from a plant which he had brought into the greenhouse to make cuttings from, desiring to increase his stock so as to plant a hedge. It was brought in at about the same time with the deutzias, and the plant, which was three feet high, was now covered with flowers. He thought it would be valuable for forcing as a flowering plant.

Charles M. Hovey thought that it would require too much room to force the *Philadelphus;* if, however, a gentleman had plenty of space it would be desirable, but they could not be raised in the low houses commonly built now for forcing. The weigelia and similar shrubs, are also frequently forced, and are very beautiful. It is considered by gardeners more of a feat to force some of these things out of season than to grow tender plants in season. All these forced shrubs add variety, interest, and beauty to every collection, but as a matter of profit, estimated by their money value, there is little in it. This, however, should never be connected with real art.

E. W. Buswell thought that more might be done in the way of forcing hardy flowers than is now, and instanced some blooms of *Hemerocallis flava* on exhibition. He believed that if more attention were given to ascertaining the adaptability of hardy things to forcing, many beautiful flowers would be found eligible.

Mr. Hovey read from "The Garden," Vol. IX, p. 185 (February 19, 1876), in the weekly calendar of operations, directions to "introduce into the forcing houses, from time to time, a few plants of a hardy nature, such as rhododendrons, azaleas, deutzias, lilacs, weigelias, sweetbriars," and plants of that class, showing that it was a common thing in large private establishments. In England these plants are considered more important and often more attractive than others of far greater value.

Mr. Atkinson, being called on by the Chair to give some information in regard to forcing roses, said that few of us had seen better roses than those shown by Mr. Comley. The rose, or any other plant, to be forced successfully, must be *in condition*, which means a great deal with plants, as well as with horses. The object of the cultivator should be, by careful preparation to bring them into proper condition for forcing. They should not be left until they have to be pried out of the ground with a crow-bar. His practice was, not to neglect the plants after forcing, but to look to them carefully and keep up the growth, and if we do this there is no reason why we should not have as good roses as Mr. Comley's. The great drawback is that the wood does not ripen, and the cardinal point of success is to get the plant into good condition, with well ripened wood. If you have a spare house, or a spare cold frame, the best way is to bring them on gradually. He had a neighbor who places them in a cold vinery, and whose plants were now a solid sheet of bloom. He plants them out in summer and lifts again in September, subjecting them to a little frost—just enough to kill the foliage. The best soil is a heavy one; not a clay, but a good, stiff loam, with a little well rotted cow manure and a little sand. The roses exhibited are called Hybrid Perpetuals, but the Noisette, Bourbon, and China roses are so much mixed now, that it is difficult to distinguish the blood of the different classes.

Mr. Hovey corroborated what had been said by Mr. Atkinson, and added that it was of no use to undertake to cultivate such plants in a mixed collection. The most careful preparation would

be of no avail if they were placed at once in too much heat; there would be plenty of foliage and red spider, but few roses. He would take up in September, place in a half shady situation, and have them judiciously watered, and then the foliage would assist the growth of roots. Roses seldom lose their foliage until the last of October, and we occasionally see a flower in November; and when managed in this way the plants have two months to grow. To be forced successfully there must be a cessation of growth and a ripeness of the wood. As the nights become cool the leaves turn yellow and the wood ripens gradually. The means of ripening are withholding heat and water. It would be foolish to leave the plants in the ground until a crow-bar was required to dig them up. You might as well attempt to force a crop of grapes by raising the temperature at once to 80°, as a crop of roses.

The Chairman said that the foliage, if sustained by showering and keeping the plant close, certainly did encourage root action. But the question to be decided was whether it was desirable to submit the plant to the action of frost. Strawberries should be exposed to frost before forcing, so as to cause vegetation to cease.

Mr. Hovey thought there was no necessity for exposing roses to frost. It might not injure them, but it would not do them any good. He would not subject even strawberry plants to frost. In California, where they never see frost at all—certainly nothing more than white frost—they have abundant crops of strawberries, pears, and all other fruits.

John B. Moore did not believe that hardy roses could be forced with the best success when planted in the ground in summer and taken up in autumn, but would keep them in the pots. He had exposed his to frost severe enough to burst some of the pots, and now had plants with thirty buds on each. They were placed in a cold frame and the pots covered with leaves to the depth of six inches, and remained there until quite cool weather. Neither did he believe that they needed a separate house, for he had grown them in the same room with smilax, tea roses, pelargoniums, etc. They could be grown as Mr. Hovey and Mr. Atkinson had stated. Mr. Comley grew his in pots, and the tops had all been exposed to frost. While he did not believe that freezing the soil in the pot would do any good, in his own case it had certainly not done any harm.

Mr. Atkinson said that Mr. Nelson, the neighbor of whom he

had previously spoken, had forced roses for fifteen or twenty years, and when turned out of the pots the roots are a mass of fibres. He knew that they could be forced when turned out. He knew a man who forced from five hundred to a thousand plants yearly.

Mr. Hovey read the notes of his remarks at the meeting on the 19th of February, in which he stated that the plants should be grown in pots to ensure the best success, and said that if they had been planted in the ground and were to be taken up, it should be done in September. Mr. Paul, the English rose grower, had shown a plant with two hundred blooms, and he kept them for fifteen years in pots. Undoubtedly they can be grown successfully by potting in autumn. Mr. Nelson's plants were finer than any that have been shown here, and he plants out. Mr. Hovey thought that those who are not proficient would do better to plunge and shift their plants, and bring on a perhaps premature ripeness of the wood.

The Chairman asked, Why not ripen the wood earlier, by withholding water, so as to start them earlier? He had supposed that frost was a more desirable element than the gentlemen who had spoken appeared to think.

Mr. Atkinson said that ripeness of wood is an indispensable condition. Drought and frost have the same effect. In California the only way they can ripen their wood is by withholding water. Cold and heat have the same effect on vegetation. A rose which has produced such flowers as are exhibited to-day, has made three-fourths of its growth. He had roses with shoots fourteen or fifteen inches long, and if these were not taken care of after flowering, there would be but a small show of bloom another season. He would say to any amateur beginning to force roses, that if he did not get an abundance of flowers the first year he should not be discouraged.

E. W. Buswell asked whether *Deutzia gracilis* could be forced without being subjected to a season of frost.

Mr. Wilder said he had forced them when they had been only subjected to a slight frost, but they would have done better if they had been frozen thoroughly so as to put the plants entirely at rest.

Mr. Hovey thought the subject was somewhat in doubt. It is very difficult to establish what is successful cultivation. He had a hundred deutzias which had not been out of the pots for five

years, except to be repotted. They are placed out doors after blooming, as soon as can be done with safety, and in August such as need it are repotted and others are top dressed. They are only exposed to frost enough to take off the leaves.

Mr. Buswell said that the point which he desired to ascertain was whether hardy plants would not give more satisfactory results when forced, if first subjected to such treatment in regard to freezing as nature gives them.

Mr. Hovey thought that they would not. His plants begin to lose their leaves early in September, and often have lost all their foliage before severe frost. He would not subject them to frost were it not to keep them back. Perhaps some of them got frozen through, though he took especial pains that they should not, by throwing a few leaves over them, as freezing hard would break the pots, but he saw no difference among them which he could attribute to freezing. He never put a plant into the house that to his knowledge had not been exposed to frost at all, but thought it would neither injure nor benefit them.

Mr. Buswell was still of the opinion that plants would force better if we could supply all the conditions under which they naturally grow.

Mr. Wilder thought frost for the tops was advantageous because it puts the plants to rest.

Mr. Buswell said that there was more or less activity in the sap in the roots of plants even when frozen, and asked whether the activity might not be so great, when not frozen, as to interfere with forcing.

Mr. Atkinson did not believe in frost; he took up all his plants while still in foliage, and syringed. Possibly they might have got some frost. Every year as soon as they had ceased flowering he took care to remove all the old wood.

The Chairman said that no gentleman had taken the position that frost is absolutely necessary. In a cold climate, snow falls early and the ground is not frozen. Yet it seemed to him that there was an advantage in a moderate frost. It is a method provided by nature for ripening the wood. We are obliged to work in a short time, and the slight freezing gives us the desired effect. He was engaged in some experiments which he hoped would enable him to pronounce a positive judgment on the point. He had taken plants that had been forced, and by artificial means

subjected them to frost in August, for the purpose of putting them to sleep and giving a more perfect rest than by merely drying, so as to force again in November or December.

MEETING FOR DISCUSSION.

SATURDAY, March 18, 1876.

W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The following paper was read by the Professor of Botany:

THE HERBARIA OF THE MASSACHUSETTS HORTICULTURAL SOCIETY.

BY JOHN ROBINSON.

At previous meetings of this Society, the subject of forming an Herbarium has been occasionally mentioned, and the hope expressed that at some future time such a collection would be made. While looking over, this winter, the various dried plants that have from time to time been presented to the Society, some members of your Committee suggested the propriety of having these collections arranged and made available to the members for reference. It was also thought desirable that a report should be prepared, stating what these collections were, with suggestions as to their improvement. I have carefully examined the several packages, with the assistance of the Secretary, who has given me the names of the donors and the dates of presentation, and find them to be as follows: —

No. 1. From Giuseppe Monarchini, M. D., U. S. Consul, Island of Crete, a Corresponding Member of the Society; May 3, 1851. A collection of plants from Crete, consisting of some fifty species, mounted on twenty sheets of paper partly, named, but not systematically arranged.

No. 2. From "A Lady in Roxbury," August 9, 1851, as well as can be determined. This "collection of flowering plants and grasses," as the report in the TRANSACTIONS of the above date designates them, consists of some ten sheets, arranged with a

greater view to the artistic effect than to their horticultural or botanical use.

No. 3. From Mrs. Isaac Clements, Mechanicsville, Saratoga Co., New York, March 1st, 1856. A collection of native plants, of about sixty species, probably collected at the above mentioned locality, mounted on small sized paper. The specimens, except that in most cases they are fragmentary, are quite good. It appears that the Society awarded Mrs. Clements a Silver Medal for this collection.

No. 4. Three collections, made by Dennis Murray, of Roxbury, a member of the Society and a frequent exhibitor of native plants at its rooms, presented by his daughters, November 9, 1864, after his decease.

A. One of flowering plants, collected chiefly near Boston, of about one hundred and twenty-five species, mostly in good order, mounted on paper smaller than the usual size, of a quality too thin to be serviceable.

B. A collection of Vascular Cryptogams (Ferns, Equisetums, Lycopods, and Selaginellas), about eighty species, and some duplicates. These are from America and Great Britain; the American chiefly from New England and the Middle States. Many of the species represented are quite rare, and the specimens are generally good. They are not systematically arranged, are mounted on paper above the usual size, and are adorned with various borders of fancy and high colored paper, quite out of place in so excellent a collection.

C. A collection of grasses, comprising some sixty of our native and introduced species. The specimens, which are remarkably fine, are mounted on various colored papers, but in such a manner that they might be easily transferred to a paper of proper quality and size. Most of the species are named and the place of collection given.

No. 5. Donor and date of presentation unknown. A collection of about thirty native and garden species, mounted on some twenty sheets; the specimens are in fair condition.

No. 6. From George E. Davenport, June 5th, 1875, the collection of American Ferns, which was properly noticed under the above date in the TRANSACTIONS of the Society. Mr. Davenport has since then added some new species and improved others, and, as stated at the time of presentation, this is one of the best and most complete collections of American ferns extant.

So far as I can learn, the above comprise all the collections of dried plants that have ever been owned by the Society. At one time some casts of fruit, which might be considered as coming under the head of the Herbarium, were purchased, but proving unsatisfactory and of little use, they were deposited elsewhere.

In order to form some idea of the expense of collecting and caring for a collection of dried plants, I have obtained a few data from those in charge of the Gray Herbarium at the Cambridge Botanic Garden. This collection, which is not yet complete, comprises over 250,000 specimens of flowering plants, besides the Sullivant collection of mosses and plants of some other orders. It requires a room as large as the Library Room of this Society for their proper arrangement, besides two or three smaller ones for work-rooms. It requires the constant labor of about three persons, one of whom must be an excellent descriptive botanist, and the cost of the paper used would alone amount to a large sum, which with salaries and contingent expenses, would be increased to fully four thousand dollars a year. The collection of the Boston Society of Natural History, though very much smaller than the Cambridge Herbarium, requires the work constantly of one person. The herbarium at Kew, England, is the largest in the world, and that at Cambridge the largest in America.

Every plant in an herbarium must be poisoned to prevent the ravages of insects, attached to the paper upon which it is to be displayed, and the whole collection must be occasionally examined to ascertain if free from insects and mould. After all this is accomplished, only such persons can be allowed to refer to the collection as are familiar with the use of herbarium specimens, for the slightest carelessness in handling, or the disarrangement of the species, gives endless trouble to those in charge to repair the damage to the specimens or to rearrange the sheets.

We have very near at hand the extensive collection at Cambridge and the somewhat smaller one of the Natural History Society in this city. To these collections, through the kindness of those in charge, the members of this Society have often referred, and without doubt can do so in the future. Inasmuch as this is a society for the promotion of horticulture, and not, except where the two studies intermingle, for botanical work, it would seem inexpedient to undertake, with the present accommodations and requirements of this Society, to collect a general herbarium, especially

when we consider the great expense and the amount of room and care required for its preservation.

The library contains works on nearly every family of plants that is needed for reference, the plates, in most instances, being better, on account of color and perspective, than the dried plants themselves would be, for ordinary identification. The principal needs seem to be works, as yet unpublished, on American Ferns, Grasses, Willows, Asters, Golden-rods, and perhaps a few others of the larger genera of native and foreign plants.

The Society has now a very complete collection of the American Ferns in perfect order. Judging from the frequent reference made to this collection, it seems to form a very valuable addition to the library. It would appear desirable that a collection of native and introduced grasses, for which there is already an excellent foundation, the asters, golden-rods, and willows should be formed. They would occupy but little space, be easily taken care of when once in order, and are all plants which may be readily collected. The ferns and grasses are plants which, when dried, retain nearly all the characters they possess when in a living state; the others retain their characters to a considerable extent, but not so remarkably as the ferns and grasses. Very many plants, often whole families, when prepared for the herbarium would scarcely be recognized by the unpractised eye as being the same species when seen in the living state.

Much has been written and said recently concerning the utility of museums and collections, and the feeling is rapidly gaining ground that something more is necessary than a scientific name attached to the specimen on exhibition. In Europe, according to the reports of their museums, particularly the English, they do not consider it beneath their dignity to place on the labels a full account of the specimen, and at the great South Kensington Museum, the money value of the article on exhibition may be seen. Few of the institutions in this country have done much as yet towards making their collections of educational value to the public, but many are commencing illustrative collections in certain departments, arranged and labelled in a manner to instruct the visitors, even should they be entirely ignorant of scientific matters. A horticultural society can be expected to do but little in this direction, though descriptive labels could be placed on any new or curious plants, particularly our native species when on exhibition,

but in an herbarium much might be done toward this end. Suppose the Society should form a complete collection of the native and introduced grasses, arranged as specimens usually are in an herbarium. Each label might state,

1. The scientific name, with the synonymes.
2. The best English name and the local synonymes.
3. Whether native or introduced.
4. Where it originated.
5. Whether annual, biennial, or perennial.
6. Whether of value as an agricultural or horticultural product.
7. District, climate, and soil best adapted to its growth.
8. If of horticultural value, its uses.
9. If of agricultural value its rate of production per acre.
10. Any other facts or information of value concerning the species.

The following is an example of the label proposed:

1. *Phleum pratense*, Linnæus.
2. *Timothy.* (From Timothy Hanson, an early cultivator.)
2. *Herd's Grass.* (In New England and New York, not of the South.)
2. *Cat-Tail-Grass.* (Of England.)
3, 4. So long under cultivation that the native habitat is in doubt, Gray considering it introduced from Europe; Pickering considering it an American species.
5. *Perennial.*
6. A valuable *agricultural* product.
7. "Thrives best on moist, peaty or loamy soil; not suited to sandy or light gravelly lands." Flint, "Grasses and Forage Plants," 1874.
9. *Yield* of hay, two to four tons per acre; of seed, ten to thirty bushels per acre.
10. A coarse grass, not successful south; very extensively cultivated north.

A collection so arranged would give all the information that a complete book on the subject could furnish. The same thing could be done with other orders and genera where no works are published describing the species. In this manner the herbarium would be made an accessory to the library, rather than a separate department, which, for a society like this, would seem to be the most satisfactory arrangement, and certainly the least expensive.

In case this Society should be presented, which is not improbable, with a collection of any considerable size or value, an arrangement might be made with one of the herbaria in this neighborhood, to deposit it with their collection, thereby improving an herbarium already existing and provided with the proper means for carrying it on. The members of this Society could refer vexed questions to those in charge of these collections, quite as readily as to a partially complete collection in the Society's rooms, and with much more satisfactory results.

Discussion.

Leander Wetherell expressed himself as very much pleased with the paper which had been read, both as to its suggestions and objections. If we should collect a general herbarium we should require an additional building for its accommodation, and the expense would be even greater than was estimated by Mr. Robinson. It is very difficult for those unused to it, to identify plants by herbarium specimens. Schleiden, in speaking of the errors made by British writers on plants, said that any of the authors or editors were competent to correct them if they had gone into the field instead of to the dried specimens. As an illustration of the little knowledge of ferns possessed even by educated persons, and the need of such collections as that presented by Mr. Davenport, Mr. Wetherell said, that last summer he heard two graduates of Amherst speaking of the *flowers* of ferns. He approved of the proposal that we should complete the collection of grasses, of which we have so good a nucleus, and also suggested a collection of heaths. He had a small collection of grasses of his own, which he found very useful in identifying those sent to him for name; they are more valuable than the best engravings. He knew of no department of botany, concerning which there is so much need of information among farmers, as on the grasses. The "blue grass" of botanists is the *Poa compressa*, while the blue grass of agriculturists is the *Poa pratensis*. He went with a friend to Kentucky, to see what the famous blue grass was, and found it the same as the June grass of New England, but growing much more luxuriantly, one stalk being four feet seven and one-half inches in height, while a plot averaged from three to three and a half feet. Brutus J. Clay said the early emigrants were in the habit of stopping at a place called "Blue Licks," and the farmers of Kentucky,

finding the grass which sprang up there an excellent pasture grass, were in the habit of going thither to cut grass for seed, and hence the name of "blue grass." The farmers frequently apply the name of June grass to the *Danthonia spicata* (wild oat grass), sometimes more aptly than correctly called "poverty grass," a very worthless grass, and if we had specimens of both we should see the difference. When the botanist is laughed at for the names which unaccustomed tongues find so much difficulty in pronouncing, he knows that he cannot communicate with certainty what is in his mind to another botanist, without these names.

Dr. W. P. Bolles said that he had been very much interested in the subject before the meeting, and heartily concurred in the suggestion to complete the collection of grasses, but would be very sorry to see the Herbarium limited to these and the collection of ferns. He thought the Umbelliferæ, or Parsley family, was one of which it was very desirable, on account of the difficulty experienced by beginners in distinguishing the species, that we should have a standard series for consultation. He also suggested that we should make an herbarium of native North American plants, which are often known by different common names in different sections of the country. Specimens of even the most common weeds would be very valuable for examination by farmers and horticulturists. He thought the notes of which Mr. Robinson had given an example, very desirable, and in addition to such as might be made by the donors of specimens, would have others by competent persons. He thought an herbarium of the flowering plants of North America would not be beyond the limits of the room or means of the Society. A hundred species, with genus covers, would occupy only about six inches in height.

Edward S. Rand, Jr., thought we were under obligation to the Professor of Botany for bringing the subject before the Society. Though for many years one of the Library Committee, he did not know that we had any specimens beyond the Davenport collection of ferns. Although plates, either colored or plain, are in some respects preferable to dried specimens, there is a knowledge to be gained from the specimens which cannot be got from the plates. Neither can take the place of the other. A small collection of the most desirable plants would take but little room. Our book-shelves are already overflowing, and more room must soon be provided, and as a small collection of the most desirable plants would

occupy but little space, it should be considered in providing room for the increase of the library. He suggested that the Chairman of the meeting should bring the subject before the Society at a business meeting.

Charles M. Hovey regretted that he was not present in season to hear the report of the Professor of Botany, for he had not missed a paper before since these discussions were commenced. He liked to be progressive, and to do what we could for kindred sciences, such as botany and entomology, but thought that if we divided our energies among several branches of science we should accomplish far less than if we concentrated them on the appropriate work of the Society. The London Horticultural Society is now wrangling over the question whether or not it shall go out of existence, and was long since obliged to sell its fine library and herbarium to discharge its indebtedness. This embarrassment Mr. Hovey attributed to the large amount of money (£30,000) spent on its publications, and to its engaging in enterprises not legitimate to the work for which it was established. Mr. Hovey said we should soon have more botanical books than we could accommodate; he thought we had more now than we ought to have, though he was as fond of books as any member, and had more in his library than he had space to accommodate. The Natural History Society had a large herbarium so near that it was not worth while for us to undertake one, and though he would not refuse specimens that might be presented, this branch should be made incidental to the main work of the Society. He had an herbarium of the plants of Cambridge, collected a great many years ago, which he had not looked at for a long time. We should not go into those things which will take up so much room or cost too much money.

Mr. Rand replied to Mr. Hovey, that he failed to see the propriety of the argument drawn from the position of the London Horticultural Society. It was only after the Society had spent too much money for premiums and on their garden, that it went into the projects of which Mr. Hovey complained, in the hope of thereby retrieving its financial position. Mr. Rand differed entirely from Mr. Hovey in regard to the library — he thought we should aim to secure for it every horticultural and botanical publication, and should endeavor to make the herbarium equally complete. He suggested that Mr. Hovey might make a good disposition of his superfluity of books and herbarium specimens by adding to the collection of the Society such as are not already in it.

Robert Manning thought that the value and importance of the central location possessed by the Society were not appreciated by all. Many persons would come here to consult an herbarium, who would not go over to the Natural History Society's building or to Cambridge for that purpose.

Mr. Wetherell added a word in regard to the importance of accompanying the specimens of grasses with such notes as were recommended by the Professor of Botany. In his view these notes would be of great value, which he showed by reference to the *Poa nervata* (now *Glyceria nervata*) or fowl meadow grass (confounded with *Poa serotina*), and said that he went to Professor Gray with specimens of each, and when he inquired in regard to their utility and economical value as farm plants, Prof. Gray replied, that he had no right to ask such a question of a botanist. This set him to thinking which was more useful — the man who understood systematic botany, without any knowledge of the economical uses of plants, or the man who knew the uses of plants but was ignorant of systematic botany, and he concluded, from the practical standpoint, that he would rather be the latter. Mr. Wetherell alluded to the valuable results of the investigations into the utility and cultivation of grasses by the Duke of Bedford, as recorded in the "Hortus Gramineus Woburnensis." He did not agree with Mr. Hovey in regard to books, for it is hard to draw the line between horticultural and botanical works.

Mr. Hovey said, that we should never have had the valuable "Catalogue of Fruits" of the London Horticultural Society, if that society had not given its attention strictly to horticulture. In regard to the library, he did not care how many horticultural books we had. The Linnean Society of London never meddled with horticulture, and he would confine the work of our Society strictly to horticulture.

Dr. G. F. Waters remarked that a short time ago steps were taken by the Boston Society of Natural History to organize a botanical section, and he felt no doubt that at some future time all the departments of that society would be in charge of separate sections.

The Chairman said that so much interest had been awakened in the subject, that, if no one else undertook it, he would bring it to the attention of the Society at a business meeting.

E. W. Buswell mentioned that a plant of *Phormium tenax variegatum* (New Zealand flax), was exhibited in flower to-day for the first time, by Charles S. Sargent. Mr. Buswell also showed a small mat, made from the fibre of this plant by the native Maoris of New Zealand, prepared and woven with no apparatus but water and stones. This was sent in by Miss Hannah E. Stevenson.

The Chairman remarked that the variegated form of the New Zealand flax was one of the most beautiful of all variegated plants.

Mr. Hovey said that the common green variety did not seem to be very generally known. He alluded to Dr. Henry Perrin, who lost his life while endeavoring to establish the cultivation of this and other tropical plants in Florida, many of his letters having been published in the "Magazine of Horticulture," nearly forty years ago. The plant can be grown without protection, as far north as Charleston, S. C., and also in Ireland, where it was grown by a nurseryman for strings, which were made by merely tearing the leaves into strips. Mr. Hovey had used it in this way himself in a half green state, and found it very strong. It might be grown all through the Southern States. It does not require the protection of a greenhouse, but may be kept over winter in a cellar or cold frame. The roots are fibrous, so that it need not be potted. It has a fine effect on the lawn, where it should be associated with yuccas, agaves, and similar plants. Although the variegated form is very beautiful, it was a question whether, if all plants were variegated, the green form would not be considered quite as beautiful. It is novelty which gives value to many plants. The plain green *Phormium*, with its tall, erect, sword-like leaves, is a grand subtropical plant.

Mr. Buswell believed the public taste was running wild on variegation. While some plants, from the breadth of their foliage and distinctness of variegation, were objects of beauty, others were so variegated as to appear at a little distance as if they were dying.

Mr. Robinson remarked that the *Phormium* belonged in the Lily Family proper.

MEETING FOR DISCUSSION.

SATURDAY, March 25, 1876.

W. C. Strong, Chairman of the Committee on Publication and Discussion, in the chair. The meeting was opened by the reading of the following paper:

CHEMICAL FERTILIZERS.

BY HENRY F. FRENCH.

At the request of your Committee I have consented to read at this meeting a paper on Chemical Fertilizers, a subject upon which I claim to have no peculiar knowledge, beyond what may be acquired by any careful observer and reader. I am no chemist, and shall not attempt to speak with scientific exactness. There are certain theories and conclusions, however, in which all modern chemists agree, and which it is well for us to bear in mind in this discussion.

The third edition of "Liebig's Agricultural Chemistry," which I happen to own, was published in 1843. At that time the analysis of plants, and of soils, and of fertilizing agents, with reference to supplying to the soil the elements of plant growth, seems to have been a familiar subject of scientific research. Chemical analysis had already shown clearly of what elements plants are constituted, and that certain of these are derived in abundance from the atmosphere and water, and certain others are derived chiefly from the soil. It had also been ascertained that most soils contained inexhaustible supplies of some of these elements, as, for instance, of silica; and that most soils did not contain enough of certain other elements, as potassa and phosphoric acid, to produce many crops, without restoring, in some form, these essential elements.

It was also well understood that different plants contained these essential elements in different proportions, and consequently that the food furnished them should contain these elements in the proportions in which they were found by analysis to exist in the plants. We find that this idea was so familiar that Liebig and the men of his time, spoke of certain classes of plants as potash

plants, and of others as lime plants. Indeed special manuring, as in the use of superphosphate of lime for the turnip crop has been generally practised in Great Britain for a quarter of a century at least.

Knowing what elements plants must derive from the soil, it was natural enough that chemists should attempt, by an analysis of the soil, to ascertain whether those elements exist in the soil in proportions sufficient to nourish the proposed crop. About twenty-five years ago, in this country, the analysis of soils for this purpose, was advocated by Prof. Mapes, Dr. Lee, and others, as a safe practical method of ascertaining what fertilizers were necessary to be applied for a given crop.

In this direction, chemical science soon found a limitation, as applied to practical agriculture. As an illustration, it was found by actual analysis that a rich soil from the Scioto Valley, was apparently no more fertile than a sterile soil from Massachusetts. The chemist in his laboratory could extract in a single hour from a granite pebble, or from sand, more potash than a plant could extract in a hundred years. It was soon found that, aside from the practical difficulty of procuring for the chemist a fair specimen of a field or a farm, it was necessary not only to consider the physical condition of the soil, but also the condition, chemical or otherwise, in which the fertilizing elements exist.

Equivalents in the chemical laboratory are found not to be always equivalents as fertilizing agents. It seems to be generally conceded that the mineral phosphates of lime, although by chemical tests they appear to possess the same elements of plant food as the animal phosphates found in bone, yet do not produce the same valuable effects upon our crops.

A theory advocated by Prof. Mapes, and supported by some French chemists, is interesting in this connection. It is called "The Progression of Primaries," and is based upon the idea that the elements of plant food increase in value as they progress from the mineral through the vegetable and the animal kingdom. The particle of lime or potassa that is found in the rock is taken up by some plant and becomes part of it. It is then devoured by some animal and becomes a part of the animal, and by and by returns by decomposition to the soil. Having been thus many times assimilated into the higher forms of life, it becomes better fitted for its future round of service, and enters more readily into the

organization of new plants. The theory is certainly plausible, whether founded in truth or not.

Chemistry is indeed limited on every side, however important its contributions to knowledge. The chemist can analyze the grain of wheat and tell us precisely its component parts, but let him take all the elements of wheat, and see whether, with all his science and skill, he can make a grain of wheat, or a quantity of flour, or any of its products. Why, if he knows what wheat is composed of, and the precise proportions of his elements, can he not form the grains; and why, when thus formed, will those grains not vegetate, and grow, and bear fruit? The answer occurs to every reflecting mind. The Omnipotence that formed the grain of wheat, and implanted in it a principle of life and growth and reproduction, is not to be measured by the chemist.

The Life Principle, which guides and controls the plant, from its germ, through every stage of growth, in leaf and stem and flower and fruit, the chemist by subtlest analysis cannot reach. Science cannot tell him why the acorn should always produce an oak, and not a chestnut. No analysis, however minute, can give him a hint even, of what gives its color to the rose, or its fragrance to the violet; or what imparts to one plant its deadly poison and to another its medicinal power of healing. Why the same soil, enriched by the same food, watered by the same dews and rains, breathed on by the same air, and basking in the same sunshine, should yield an infinite variety of form, of size, of color, of perfume, of taste and qualities, is yet beyond the scope of science.

There are certain habits and instincts in plants which to this day find no explanation through science. I once asked a learned professor why is it that the common hop always twines about the pole which supports it, from east to west. Of the fact there is no dispute. Among a million plants there is no exception. My friend, after a little reflection, said he thought it might well enough be accounted for by the attraction of the light of the sun. As the sun rises the plant is attracted toward him, and follows his course toward the west. I replied that his explanation seemed reasonable, and I should like now to have him explain why the bean always twines round the pole in the opposite direction, which you know it always does. He said it was easier to deny the fact than to explain it, and he did not believe a word of it.

What we call chemical affinities and chemical combinations, are

mere names for what we do not comprehend. Phosphoric acid and lime will combine in two proportions only. Two atoms of each form phosphate of lime. Three atoms of phosphoric acid and one of lime form superphosphate. Nobody can tell why they may not as well combine in other proportions. To change phosphate of lime, which is said not to be readily soluble, into superphosphate, we make use of the chemical affinities of the substances. We have seen that in phosphate of lime, the phosphoric acid and lime are chemically combined in the proportion of two and two. They form a sort of equal union or marriage—one bone if not one flesh. Now to break up this union and entice away from the phosphoric acid the lime, which may be regarded as the weaker vessel, we bring into her neighborhood an object of stronger affection or affinity. Sulphuric acid and lime are found to have a stronger affinity for each other than phosphoric acid and lime, and by adding sulphuric acid, we entice away a portion of the lime, forming the new combinations, sulphate of lime and superphosphate. Why these affinities exist, and why these new combinations are formed, it is as difficult to explain, as why one young gentleman and lady have a stronger affection for each other than for all the world beside.

What new combinations take place in the soil after our fertilizers are applied, we can only guess, and many substances produce effects entirely beyond our comprehension. Two hundred pounds of gypsum applied to an acre, ten inches in depth of which will weigh two million pounds, have on some soils produced an almost magical effect; yet I suppose chemistry has thus far failed to solve the mystery. It is thought that the elements that compose gypsum do not enter into the composition of the plants, but its effect is due to its chemical action upon other nutritive elements, probably potash and magnesia, rendering them available to the growing crop. Liebig says that he found by experiment that a solution of gypsum in contact with arable soils underwent decomposition, and formed combinations quite contrary to the ordinary affinities as observed in the laboratory.

Among the ideas most common with those who discuss the growth and feeding of plants is this, that the roots can only take up their food in a form in which it is dissolved in water, and the word *soluble* is usually understood as meaning soluble in water.

Liebig's opinion seems to be this, and it appears to be entirely

reasonable. The roots of land plants are in direct contact with the particles of the soil. A quantity of moisture, but no more than the soil holds by attraction, is essential to growth. The soil holds the elements of food, whether conveyed to it in fluid or other form, and the solution of the solid elements is effected in the pores of the cell walls of the roots, whence they pass into the system of the plant.

We know that stagnant water is injurious to land plants, and so that only so much of the plant food as is *not* carried away by watering is beneficial.

That the elements of fertility, such, for instance, as potash, may be washed out of a soil in which they abound, as potash is washed out of ashes, is well known, but it does not follow that the soil, if of a fertile character, does not retain as much of these elements as is good for the plant. If this is not so, why, in the daily watering of plants in pots, is not all the fertility washed out of the soil, so that the plant should require daily fertilizing as well as watering.

Liebig cites, in support of his theory, the beautiful experiments by Professor Nägeli and Dr. Zoeller, in the Botanic Garden at Munich, in which they grew these plants successfully in a soil containing all the elements of their food in an *insoluble* state. It may be interesting to observe that these experiments were conducted with the three elements and those only, which Prof. Stockbridge uses in his fertilizers, namely, nitrogen, potash, and phosphoric acid. * Indeed Liebig ascribes to the soil itself a power which seems to override and control the chemical combinations by which we endeavor to accommodate what we deem to be the wants of the plants. "The arable soil," he says,† "decomposes all salts of potash, of ammonia, and the soluble phosphates; and the potash, ammonia, and phosphoric acid always take the same form in the soil, no matter from what salt they are derived."

He maintains, as we have said, that plants are by no means limited to such elements as are soluble in water, but that they "possess the power of absorbing their necessary nutritive elements from a soil in which they are present in physical combination, *i. e.*, in a state wherein they have *lost their solubility in water*." ‡ In proof of this, he says a rye plant will yield a thousand fold in a fertile soil, "yet this plant draws its mineral food from a volume

* Natural Laws of Husbandry, page 114. † Ibid, p. 119. ‡ Ibid, p. 118.

of earth, from which the most persevering lixiviation with pure water, or water containing carbonic acid, will not extract even the one hundredth part of the phosphoric acid and nitrogen, nor the fiftieth part of the potash and silicic acid, which the plant has drawn from the soil." * And, what seems conclusive on this point, he says that if plants did receive the food from a solution which might change its place in the soil, the principle nutritive substances must long ago have run away in the brooks and rivers. "For thousands of years, all fields have been exposed to the lixiviating action of rain water without losing their powers of fertility. In all parts of the earth, where man for the first time draws furrows with the plow, he finds the arable crust, or top layer of the field, richer and more fertile than the subsoil." † And although he admits that plants will grow in watery solutions of mineral elements, yet he says they bear no comparison with plants grown in a fertile soil.

Prof. Johnson, of Yale College, examining the statement of Liebig and others, adopts the conclusion that water is capable of dissolving from the soil all the substances that it contains which serve as the food of plants, though I think a careful reading of his discussion of the point leaves the question in great doubt. ‡

In another part of his treatise, he says the roots "supply the plant with large quantities of water when the soil is so dry that it has no visible moisture." § We may add that in California it is not unusual to plant and harvest crops of grain without a drop of rain in the whole season. And in the last page of his book, Prof. Johnson as nearly gives up his position as could well be done, without an absolute surrender. He says in italics, "Those bodies which are most rare and precious to the growing plant, are by the soil converted into, and retained in, a condition not of absolute, but of relative insolubility, and are kept available to the plant by the continual circulation in the soil of the more abundant saline matters." ||

Enough has been said, in these mere suggestions of the embarrassments attending the investigation of the subject of chemical fertilizers, to render us cautious in our examination of the claims of any supposed new theory of chemical plant feeding. The attention of the civilized world has for a generation, at least, been

* Natural Laws of Husbandry, page 109. † Ibid, p. 108.
‡ How Crops Feed, p. 316. § Ibid, p. 212. || Ibid, p. 375.

called to the subject, by men of the highest scientific attainments, and careful and long continued experiments have been conducted by those most capable of affording accurate results. In our own State, we have at the present time, almost forced upon our attention, the claims of a new series of fertilizers, to which at the request of your Committee, I propose to give some attention.

THE STOCKBRIDGE FERTILIZERS. — These fertilizers are offered to the public under circumstances so extraordinary as to challenge the attention of agriculturists everywhere. Mr. Stockbridge is Professor of Agriculture in the Massachusetts Agricultural College. His experiments have been conducted upon the college farm, and his report on the subject occupies twenty-three of the seventy-nine pages of the annual report of the college made to the Legislature in January, 1876. The president of the college alludes to the professor's valuable discoveries and says, "For the continuation of his investigations the professor ought to have $1,000 per annum for ten years." Prof. Stockbridge announces in the college report that he has "received a United States patent, covering the right to manufacture and sell fertilizers prepared according to these [his] formulas."

The new report of the Board of Agriculture, for 1875–6, contains, in a lecture by Prof. Stockbridge, substantially what the Agricultural College report contains, and so at the public cost, if not under the express sanction of that Board, the claims of the Professor are laid before the people. It is due to the Board of Agriculture, and its learned Secretary, to say that their report shows no official sanction of the claims of Prof. Stockbridge, nor indeed any allusion to them, except that his lecture at a public meeting forms a part of their report.

It is unfortunate that a patent has been taken for these formulas, because, if it is valid, it prevents the use of them except by permission of the patentee, and the payment of such royalties as he may choose to exact, and, however fairly intended to prevent imposition, gives the appearance of a pecuniary speculation to an enterprise emanating from a public institution, whose discoveries in agriculture should be as free as air to all our citizens.

PROFESSOR STOCKBRIDGE'S THEORY AND CLAIMS.—The general statement of the value and effects of these fertilizers may be found in the advertisement of the person named by Prof. Stock-

bridge in the college report as his only authorized agent, as follows:

"*Stockbridge Fertilizers.* These fertilizers are made for different crops by formulas worked out by Prof. Stockbridge, of the Massachusetts Agricultural College, and have given extraordinary results, at small cost, producing, for example, from seventy-five to one hundred bushels of corn to the acre, corresponding results with other crops, *without any manure*, at a cost of about twenty-five dollars per acre, and without exhausting the soil, but leaving it richer by actual test. That the farmer may get *the right* ingredients, separately, or properly compounded, we are entrusted by Prof. Stockbridge as *the only* parties in the country to furnish them *under his name.* Pamphlets, containing the formulas, and other valuable information, sent free."

The general theory of Prof. Stockbridge has been, in most points, familiar learning for a generation past, at least. It is that growing plants are made up of certain elements which they obtain from the soil, from the air, or from water; that by chemical analysis it is ascertained what those constituent elements are, and in what proportion they exist in a given plant or crop; that the elements furnished by the soil are *nitrogen*, *potash*, *phosphoric acid*, with lime, soda, magnesia, silica, etc.

Prof. Stockbridge assumes that all the elements of plant food are supplied in abundance by the air and water, and the natural condition of ordinary soil, except three, *nitrogen*, *potash*, and *phosphoric acid*, and for the purposes of this discussion this assumption is not questioned. Then, he says, apply to the soil these three substances in the proportion in which they exist in the crop, and this is the true manure to produce such a crop. And this is not controverted, and is in theory correct.

Referring to his published formulas, we find them all to be in this form: "To produce fifty bushels of the grain and its natural proportion of stover to the acre more than the natural yield of the soil, use" so many pounds of nitrogen, so many pounds of potash, and so many pounds of phosphoric acid. To produce fifty bushels *more* than this natural yield, he applies just as much nitrogen, potash, and phosphoric acid as are found in fifty bushels of corn and its stover.

Prof. Stockbridge says in the college report, "Allusion has already been made to the curious form of the statement of the for-

mulas. It is similar to one which might be made by a mechanic, that to cover the side of a building thirty feet long and fifteen feet high, it will require four hundred and fifty square feet of boards. It would perhaps be preposterous to say, from our limited data, that the statement of the formulas in results can compare in exactness with that of the mechanic, but a few facts in the form of figures will show that in a few years it might approximate it very closely."

Instead of this illustration in mechanics, let us try the following: I have a cow that gives daily, on ordinary feed, eight quarts of milk, which may be called her natural yield. I wish to make her give sixteen quarts per day, eight quarts more than her natural yield, and to effect this I give her the constituent elements of eight quarts of milk, and to be exact in quantity, I give her to drink eight quarts of her own milk. Why should she not give sixteen quarts the next day?

Some of the reasons why we should not expect the application to the soil of the elements of fifty bushels of corn, to add fifty bushels of corn to the crop, readily occur to us all. We may estimate ten inches of soil upon an acre, as I have said, to weigh a thousand tons, or two million pounds. We apply to this, three hundred or four hundred pounds of a fertilizer. It is manifestly impossible so to incorporate this small amount with the soil, that the roots of the corn shall find just as much more of each element as we have added, and what the plant does not find is useless to it. Again, the condition of the soil as respects drainage and pulverization, and its density, are essential. In a soil filled with stagnant water nothing but water-grass, and mud turtles can thrive, however fertile it may seem to the chemist, and a hard, compact surface, like a roadway, however rich, can produce nothing.

We are told to apply nitrogen, potash, and phosphoric acid, but these are not articles of commerce, which a farmer is expected to buy under those names at a reasonable price. The pamphlet referred to in the advertisement tells us in what form we can obtain these elements, as follows:

"*Commercial Sources of Nitrogen, Potash, and Phosphoric Acid.* Nitrogen.—From sulphate ammonia, Peruvian guano, dried blood, common saltpetre, nitrate soda, fish guano. Potash.—From muriate potash, sulphate potash, wood ashes, common saltpetre, carbonate potash. Phosphoric Acid.—From dissolved

bones, dissolved bone black, dissolved burnt bone (bone ash), dissolved South Carolina rock, dissolved Canadian apatite."

Certainly it needed no professor to tell us that Peruvian guano, nitrate of soda, and wood ashes, are fertilizers, but it does need a skilful chemist to give us the equivalents in these articles for the constituents of the Stockbridge fertilizers. Prof. Stockbridge says Mr. Judd spoiled his potatoes by using muriate of potash instead of sulphate, and Mr. Fowler made a total failure because he applied the fertilizer in a liquid form to "a coarse sand with a gravel subsoil," so that the rains washed it away before it could afford the crop much nutriment. In a printed statement, it was said by Prof. Stockbridge himself, that he failed in an experiment by using a quantity of the Stassfurth salts, which by a subsequent analysis he found to be very poor in potash. These are only illustrations of the difficulty of conducting experiments of this kind, and of the small value of single instances, in arriving at general conclusions.

The Theory contains a Manifest Fallacy. — The difficulties suggested in the way of the practical working of the Stockbridge theories, are by no means the chief objection to them. The system rests upon a fallacy, which is fatal to it. It is a system of exhaustion and not of compensation, and a very slight examination will demonstrate the truth of this statement. To produce fifty bushels *more* of corn than the land will yield in its present condition, you should apply the quantity of nitrogen, potash, and phosphoric acid, that fifty bushels of corn contain. If the land would have produced fifty bushels without the fertilizer, it should now produce a hundred bushels. You have applied the elements of fifty bushels and removed a hundred bushels. Where did the crop find the elements of the fifty bushels which you did not supply? It is part of the theory of Prof. Stockbridge, that the three elements in question must come from the soil. Then you have exhausted the soil to the extent of fifty bushels. You have treated it precisely as if you had applied no fertilizer, and taken off a crop of fifty bushels.

It seems so nearly incredible that such a system as this should be gravely recommended to the public by our Agricultural College that it will be proper to examine it more in detail. For convenience, we will continue to use the formula for Indian corn. In the college report it is in these words: "To produce fifty bushels

of the grain and its natural proportion of stover to the acre more than the natural yield of the soil, and in like proportion for other quantities, use nitrogen sixty-four pounds, potash seventy-seven pounds, phosphoric acid thirty-one pounds." The form in which these elements may be found is stated, but is not material to this point. Prof. Stockbridge assumes that fifty bushels of corn, with its stover, contains the quantities of nitrogen, potash, and phosphoric acid above stated. To show that there is no mistake on this point, I refer to the "Agriculture of Massachusetts," 1875–6, Part Second, p. 79, where, in an essay by Dr. Sturtevant, he gives, as an average result, the quantities of nitrogen and phosphoric acid removed from the soil by a crop of fifty bushels of corn and stover, within a half pound of the amount assumed by Prof. Stockbridge, and the potash precisely the same. And he adds, "The conclusion therefore is irresistible that *if* this table represents the amount of these constituents removed from the soil by our crop, then this table represents the actual exhaustion of the soil by the removal of our crop."

Dr. Sturtevant gives the true theory of compensation, to supply what your crop removes. Prof. Stockbridge supplies fifty and removes a hundred, and claims that "the soil is left in better condition than it was before being cropped by this method." *

To illustrate: he has a measure of two gallons, which is half full of a liquid. He puts into it another gallon which fills it. He then pours out two gallons, and still has more than one gallon left in it. The only parallel to this result is the instance of the poor widow's cruse in the scriptures, and that supply was miraculous.

I give another statement from the college report: *

"A plot treated in the same way in 1874, produced one hundred and four bushels of corn per acre. The normal capacity of the land at that time, as proved by a crop on our unmanured plot, was thirty-four bushels per acre. This manured plot was planted again with corn in 1875, without manure, and its yield was sixty-four bushels per acre, or thirty bushels per acre as the second result of the manure applied in 1874."

The amount of fertilizer applied is not stated. According to the theory, he put on the fertilizer to produce seventy bushels

* Thirteenth Annual Report of the Massachusetts Agricultural College, page 41.

more than the land would produce without it, for that was the result. The next year he gained thirty bushels. The results are these: He applies the elements of seventy bushels, and removes one hundred and four, *plus* sixty-four, a total of one hundred and sixty-eight bushels, or ninety-eight bushels more than he compensated, and still the land improves in condition. If such a discovery has really been made, the claim which the president of the college makes in connection with it is very moderate "that the money expended upon the college will yield a larger rate of interest than any other investment which the State has ever made." *

All the formulas are given in what the professor calls this "curious form:" "to produce so much more than the natural yield of the land." If we could assume that each acre has a permanent natural yield, which it can forever maintain without manure, then we might apply fertilizers enough for the crop in excess of that natural yield, and not exhaust the soil. If your field will yield fifty bushels, without manure, you may forever supply fifty and remove a hundred, and not exhaust the soil, though it would still be difficult to see how it could improve. It is enough to say that we have no such soil, and nobody will contend that we have. In all the experiments given, the "natural yield," as it is termed, is found by observing what a portion of the field not manured that year produced. Prof. Stockbridge in the statement last quoted, says, the "capacity of the land *at that time*, etc., was thirty-four bushels."

The following extract from the circular issued by Prof. Stockbridge's only authorized agent shows that the common notion that we must put on to the land as much as we take off is not controverted:

"If fifty bushels of corn remove from the soil sixty-four pounds of nitrogen, seventy-seven pounds of actual potash, and thirty-one pounds of soluble phosphoric acid, we cannot raise many such crops without exhausting the soil, unless we are sure we put back in the form of manure, or fertilizers, as much as we take off in the crops." †

This, it will be observed, is utterly inconsistent with the formu-

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* Thirteenth Annual Report of the Massachusetts Agricultural College, page 15.

† The Stockbridge Fertilizers and Formulas, p. 5.

las, which only require enough of the fertilizers to compensate for what we remove *more* than the natural yield.

WHAT IS NEW IN THIS SYSTEM. — Reference has already been made to the experiments of the two learned professors, at Munich, given by Liebig in his "Natural Laws of Husbandry." They used the same three elements, nitrogen, potash, and phosphoric acid, which Prof. Stockbridge uses. They cultivated their plants in pots filled with soil of the same kind, carefully prepared; and applied the elements in different proportions and quantities. I can only refer to the volume itself for the exceedingly interesting account and discussion of these experiments. I am not able to see that they do not include the whole ground covered by Prof. Stockbridge in his experiments, and they show that the three elements used by him as the essentials of plant food, were at that time familiarly known as such, and as the most essential.

In 1866 a translation was published in Boston, of a little book entitled "High Farming without Manure; six lectures on Agriculture, delivered at the experimental farm at Vincennes" (in France), by M. George Ville, Professor of Vegetable Physiology at the Museum of Natural History, Paris. In the college report of 1875, Prof. Stockbridge speaks of this author and his experiments, and says that it seemed proper to test the matter and ascertain whether it was necessary to supply the same elements in this country that were found to be necessary in France. So far as appears, he pursued the same system of experiments, with pots in a plant house, to ascertain what elements were necessary to add to the natural soils of that region to render them productive of given crops. His conclusions I have already given you, that only three elements,—nitrogen, potash, and phosphoric acid—need be supplied, nature furnishing the rest.

M. Ville, at the opening of his last lecture says: "All that I have stated to you previously may be summed up in the two following propositions:

1st. There exist four regulating agents *par excellence*, in the production of vegetables: nitrogenous matter, phosphate of lime, potassa, and lime.

2d. To preserve to the earth its fertility, we must supply it periodically with these four substances in quantities equal to those removed by the crops.

You will observe that M. Ville supplies precisely the same three

elements that Prof. Stockbridge uses, and also lime. By turning to his formula, I find that Ville uses one hundred and thirty-two pounds of quicklime to the acre, a quantity so small and cheap as to seem immaterial, and an amount more than supplied by the phosphates of lime in which the phosphoric acid of Prof. Stockbridge is found. I am unable to discern any difference in the two systems, or in their application to practice. Each undertakes to return to the soil the proportion of the three essential elements removed by the crop, and M. Ville adds, for France, a very small quantity of lime. If, however, Prof. Stockbridge really contends that he can, year after year, remove from the soil twice as much of these elements as he supplies, and constantly improve the soil, he certainly makes a claim which is original.

The fertilizer recommended by M. Ville was fairly tried by myself and others on corn and other coarse crops ten years ago. It proved successful in all respects, except that it was too expensive to be economical.

My conclusions as to the Stockbridge Fertilizers, at present are these:

That they contain nothing valuable in theory, that was not well known and fully illustrated by Liebig, Ville, and others, long ago.

That the formulas, as given, involve a fallacy, and if followed must either result in a failure of the crops or exhaustion of the soil.

That an application of enough of the elements named to actually produce a crop and maintain fertility, is too expensive for ordinary use.

Discussion.

Marshall P. Wilder supposed that the eyes of the gentlemen present would be turned to him as the representative of the Massachusetts Agricultural College, of which he was one of the founders. The paper which had been read was full of information, posting us up in regard to the history of the subject, and the writer had not only come in as evidence, but had undertaken to act as judicial authority. Mr. Wilder regretted that Prof. Stockbridge had taken out a patent for the manufacture of fertilizers according to his formulas, but the patent covers nothing except the right to *sell* these mixtures under the name of the Stockbridge fertilizers. The materials can be bought anywhere, and anybody

can mix them. Judge French has told us that plants are composed of certain elements from the soil, and has mentioned the experiments of Liebig, Ville, and others, and the doctrines drawn from these experiments are now well established. Mr. Wilder said that he was a man of progress, and he feared that the paper, if read superficially by the public, would lead them to believe that the whole matter of the application of special fertilizers is a humbug. The question is, whether these fertilizers are capable of doing what Prof. Stockbridge asserts they will do. Dr. Sturtevant, Dr. Burnett, and E. F. Bowditch, tested them last year, with favorable impressions, and though one swallow does not make a summer, yet if the fertilizers will effect only half as much as is claimed for them they will be worth more than all the agricultural colleges in the country have cost.

Dr. E. L. Sturtevant said that all must have observed how a stream that has been dammed rises gradually by retrogressions, the wavelet at the bank being now higher than the flood, and now lower, but the water continually deepening. So it is with the progress of human opinion; now a wave of public excitement rises into prominence at the apparent discovery of a truth, and then retrogresses as an error is discovered; yet new truths have been added to the old, and the general progress has been advanced. It is the advancing wave that fluctuates, but the larger water continually crowds towards the barriers. It is the advanced thinkers, and the leaders of progress, who vibrate upon the borders of the unknown, while the advance of the general public is steady. The new truths, so called, are so mingled with errors, the necessities of progress, that we must recognize in them the demands required by progress, and overlook the minor variations brought about through individual enthusiasm and one-sidedness.

He deemed Prof. Stockbridge and his formulas no exception to this general rule, and he expected to find in them both truth and error. The errors may be harmless to the wise public; the truths may be of vast importance. He did not desire to criticise the originality which he claimed, or the methods whereby he had brought his formulas before the public. His standing as an investigator and as a man of science, if such he has, should be discussed before another tribunal than this. What concerns us as farmers, is the value for manuring our fields, of the formulas to which he has given his name, and Dr. S. but mentioned his claims in order that an opinion may be expressed upon their use in farm practice.

Dr. Sturtevant stated that Prof. Stockbridge claims that by supplying to our fields the chemicals representing, in kind and amount, the materials removed by our crop, we can invariably produce the crop. That is to say, if we apply the potash, phosphoric acid, and nitrogen, which analysis shows fifty bushels of corn and its stover to contain, then we shall expect to obtain a crop of fifty bushels. He added that the mere mention of this claim brings into prominence the enthusiasm which is possessed by its originator; that his claims are supported by too few facts to receive universal credence; but still, in the present state of American knowledge, the verdict must be given "not proven," only. He said *American*, because the most of our experimental knowledge on the subject is from English sources, and Americans have been always too ready to use these for inferences, forgetting the differences in climate. Thus, in old England, the winters are mild, and the rainfall, which is large, passes down through the soil, and carries with it fertile elements. In New England, as a rule, the winters are severe, the ground is frozen deeply and the rain and snowfall passes off mostly by flowing over the surface of the land. English experiments justify the belief, for instance, that of the applied nitrogen, one-third is taken up by the crop, one-third passes away in the drainage, and one-third remains in the land in an inert form. With our different climatic conditions, does the same rule apply here? The Doctor said that we have no evidence for or against, and consequently cannot decide.

Dr. Sturtevant continued: Prof. Stockbridge further claims that his yield is intended to be above the natural yield of the soil, and defines the natural yield as being the product of an unmanured portion of the field. Here he has made an evident miscalculation. For instance, to a field which last year was excessively manured, I apply his formula on one half, and no manure on the other half. It is probable that there will be little difference between the two yields to represent the efficacy of the fertilizer. What then is the natural fertility?

Every agricultural field on any farm contains two kinds of fertility. The one is the surplus of the manure which has been applied in previous years, and which has not been removed either by crops or other agencies; the other is the natural fertility, or that amount of fertility which is food to the plant by natural agencies each year. We may measure this last fertility by a fallow yield.

The fallow yield of a piece of land is the practical measure of its fertility.

Let us apply this rule, continued the speaker, to our supposition. We apply to our highly manured field a further amount of fertilizer—say for twenty-five bushels of corn—and we obtain seventy-five bushels of crop. We claim, for this illustration, twenty-five bushels for the effect of the fertilizer applied this year, forty bushels for the effect of the manure which has been applied in past years, and of which sufficient still remains to produce this result, and ten bushels for the natural fertility of the land: for if we take a plot which is too barren to produce corn, and plough and grub and scarify for one year, the next year it will produce some corn, and the amount may be ten bushels.

Dr. Sturtevant said that he believed in the principle of the Stockbridge formulas, because it is a system; and a systematic procedure always has an advantage over a hap-hazard procedure, for it develops experience in its train. He thought it promised great present benefit to the farmer, and very much prospective benefit. Farm practice will soon remove it beyond its experimental stage, and as its defects are brought to light, the experience gained will stand ready as a corrective. He could not at present endorse this system, for it is still in its experimental stage, but he was willing to protect and cherish the chrysalis in the hopes and strong expectation of the imago which might result.

He concluded by saying that the matter is now beyond the oversight of the Professor, and that it became us all, before criticising too harshly, to give it an experimental trial, for it would take but a short time to test it by numbers, and to observe whether it would stand the test; that truth was mighty and would prevail, and that it was for the present generation to say whether progress should be present with them, for their benefit, or whether it should be embalmed for their successors. He urged not to despise the untried, nor to be too tightly bound by our prejudices, but to give the new a welcome according to its promise, and to test the promise by care-taking, cautious experiment.

Benjamin P. Ware said he had long been of the opinion that farmers could not use the commercial fertilizers offered in years past to advantage, and he had great hopes from the fertilizers recommended by Prof. Stockbridge. There was one important point omitted in Judge French's paper, and that is that nature has

the means, from her own resources, to make a fertile soil. When we get a fertile soil we find that it may be cropped for several years without manure, but when it is depleted, the question arises how to replace the deficient elements. A very large proportion of the substances necessary is obtained from the air, and farmers should attempt to assist the crops in obtaining these elements from the air. The difficulty presented in the discussion of the subject is the question, suggested by Prof. Stockbridge's formulas: How we can take away more than we put in, and still keep up or increase the fertility of the soil? The answer is, that by the application of fertilizers we aid nature in its work; and besides the substances obtained by plants from the air, the disintegration of rocks is constantly going on and adding to the fertility of the earth. It is not likely that any crop takes away all that we apply to it. He had great hopes for the farmers of Massachusetts, from the application of the principles enunciated by Prof. Stockbridge, for they have great need of such assistance as is promised by them. Mr. Ware wished again to enforce the principle that farmers should seek to aid their crops in obtaining nourishment from the air, and concluded with the remark that Nature, or God, helps that man most who most helps himself.

J. W. Talbot said that one of the greatest troubles with cultivators, in the use of fertilizers, was in not knowing what they wanted or what they applied. He liked Mr. Ware's remarks, and thought that we had overlooked the facts stated by him. We must keep up the fertility of the soil by manure, but if we can, by adding twenty-five dollars worth of manure, produce fifty bushels more of corn, we reduce the cost of our corn per bushel. He had been amused by the illustration drawn from the cow by the essayist, but the cases are not parallel. If the cow is giving all that she is capable of giving, the course suggested would be ridiculous, and if the land is producing to its utmost capacity it would be useless to add fertilizers, but the object of fertilizers is to bring it up to its full capacity.

Charles M. Hovey said that it would be impossible to discuss the subject fully in an hour. The subject has come up now because there is something apparently new in the formulas promulgated by Prof. Stockbridge. There is nothing new about them, and there ought not to be any patent on the mixtures, to prevent our cultivators from using them freely and giving them full trial.

There was some reason for giving Morse and Howe patents for inventions which they had labored during a whole lifetime to perfect, but to come forward and patent these old ideas was ridiculous, and beneath the dignity of an institution endowed by the State for promoting agriculture, and in which the patentee was a professor. Why might we not apply the elements to produce a hundred and fifty bushels; or even two hundred, as had been grown in South Carolina; or two hundred and sixty-three, as in Ohio? He did not know that there was any limit to the amount that could be produced, if you once admit it can be increased exactly fifty bushels. He agreed with the gentleman who had spoken of the large proportion of plant food derived from the air. We cut down a wood and burn it and get a large quantity of charcoal; does this all come from the fertilizer? A rich soil, if not ploughed more than three inches deep, will not produce a good crop. Jethro Tull believed that by thoroughly and constantly stirring the soil, crops might be produced continually, without the application of manure. The statement made by Dr. Sturtevant in regard to the different effects of an English and a New England winter on the soil, explained the general superiority of English lawns over our own.

Mr. Wilder thanked Mr. Hovey for what he had said. In the remarks which he had himself previously made, he wished to disabuse the public mind of the idea that the Agricultural College had any connection with these fertilizers.

Robert Manning thought that while the fact remained that these formulas were put forth by a professor in the Agricultural College, and were the result of studies in the service of the college, the public mind would not be reconciled to the idea of a patent for them.

Leander Wetherell asked if the Agricultural College did not indorse the Stockbridge fertilizers.

Mr. French replied by reading the following passage concerning them, from the "Thirteenth Annual Report of the Massachusetts Agricultural College," page 15: "If one-half of the apparent results shall be substantiated by the future experience of the farmers of the country, then the money expended upon the College will yield a larger rate of interest than any other investment which the State has ever made."

Mr. Wetherell deemed it fair to presume that the crop would take up all the fertilizers put on to produce the additional fifty

bushels, as specified in the formula. The question of the soil taking plant food from the air is an old one. If the plant depend mainly on the atmosphere for nutrition, then, he asked, what is the necessity of fertilizing the soil? and called on Dr. Sturtevant to answer this question. And why is it that a gravelly New England soil will not produce as good a crop as the Scioto Valley? An atmosphere of the same quality hangs over both. Does not Prof. Stockbridge represent that it will not pay to hire a man to cart barnyard manure? *

One farmer had spoken of Peruvian guano as supplanting barnyard manure. A Scotchman once said he had found out a new fertilizer of which he could carry enough for an acre in his vest pocket. Mr. Wetherell said that he would buy stable manure, and take good care in purchasing fertilizers. He spoke of a farmer in Westfield who got just enough more corn by applying guano, to pay for the guano. All such attempts as that under discussion, have only served to mislead farmers and cheat them out of their money. He did not believe that we can say "so much nitrogen, potash, and phosphoric acid, and so much corn." He intended, nevertheless, to try the prescription for a crop of grass.

William H. Bowker said that the patent on Prof. Stockbridge's formulas, about which so much has been said, was in effect a copyright, and should not be so severely criticised. The formulas of Prof. Stockbridge have been printed and spread broadcast, and the farmers can go where they choose to buy the materials used in compounding. Prof. Stockbridge had for his object in obtaining this patent the protection of his own name, and at the same time the protection of the farmers against gross frauds, and he should be praised rather than blamed for this course. Without the patent or copyright, scores of parties all over the country would have set up to compound these formulas, but what guarantee would Prof. Stockbridge or the public have had that they were honestly or properly prepared?

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* See his "Experiments in Feeding Plants" in the Thirteenth Annual Report of the Massachusetts Agricultural College, and in the Twenty-third Annual Report of the Secretary of the Massachusetts Board of Agriculture.

BUSINESS MEETING.

SATURDAY, April 1, 1876.

A duly notified stated meeting was holden at 11 o'clock, President Parkman in the chair.

On motion of W. C. Strong, Chairman of the Committee on Publication and Discussion, it was

Voted, That a Committee of five be appointed to take into consideration the recommendations concerning the Society's Herbarium, in the paper read by the Professor of Botany, at the Meeting for Discussion on the 18th of March.

The Chair appointed W. C. Strong, C. M. Hovey, E. S. Rand, Jr., E. H. Hitchings, and Waldo O. Ross. The Professor of Botany, John Robinson, was, on motion, added to the Committee.

On the recommendation of the Executive Committee, it was

Voted, That the Treasurer be, and he is hereby directed to send a certificate of Life Membership to George E. Davenport, as a slight mark of the Society's appreciation of the extensive and valuable collection of Ferns presented by him to the Society, and that the usual fee be remitted.

The Executive Committee also recommended the appropriation of a sum not exceeding one thousand dollars to defray the expense of collecting and forwarding fruit and other horticultural products to the Centennial Exhibition at Philadelphia. The appropriation was unanimously voted.

On motion of Marshall P. Wilder it was

Voted, That the thanks of the Society be presented to Edward Sprague Rand, Jr., for his valuable and faithful services as Recording Secretary of the Society for many years, and that a committee of three be appointed to report what testimonial shall be made in recognition of these services.

The Chair appointed Marshall P. Wilder, W. C. Strong, and B. G. Smith.

A donation of seeds from the United States Agricultural Department was placed in the hands of the Vegetable Committee for distribution.

The Library Committee were authorized to dispose of certain water-color paintings of flowers.

The following preamble and resolutions were offered by Charles M. Hovey:

The Massachusetts Horticultural Society having learned, with deep sorrow, of the death of Josiah Stickney, one of the Ex-Presidents of the Society,

Resolved, That in his decease the Society has not only lost one of its oldest and most honored members, but one who has aided and counselled by his good judgment, and promoted its objects by his many and frequent contributions of flowers and fruits.

Resolved, That we recall, at this time, the generous gift which he bestowed upon the Society for the special purpose of increasing our fund of valuable knowledge in all departments of horticulture, and acknowledge with deep gratitude the rich and timely aid bestowed on a science which it was the pleasure of his life to promote, and we rejoice that a kind Providence permitted him to see the good results of his gift.

Resolved, That we desire to place on record our recognition of the many and valuable services he has rendered, during a period of nearly forty years; our high esteem for the fidelity with which he fulfilled the duties of every office, and our admiration of his sterling qualities as a man and a citizen.

Resolved, That we sympathize with his family in their great bereavement, and offer our condolence.

Resolved, That these resolutions be entered on the records, and a copy be sent to the family of the deceased.

Mr. Hovey spoke of Mr. Stickney as one who, until within a few years, had been constantly with us, and equally constant in his contributions to our exhibitions. His love for horticulture grew out of a visit to one of the dahlia exhibitions of the Society, then the most popular autumnal flower. He became a very successful cultivator, attending the meetings at which arrangements were made for the grand dahlia exhibitions of that day, taking part in the discussions of the properties of form, color, habit, etc., which go to make up a perfect flower, and in establishing rules for the exhibitions. At that time he had only a small garden at his residence on Tremont street, but his increasing interest in horticulture soon led to the purchase of the beautiful villa in Watertown,

formerly the Hunt estate, which was afterwards his home. Mr. Hovey said that the circle to which Mr. Stickney belonged was narrowing, and he wished to place on record his admiration for so good a man.

Marshall P. Wilder said that he had been cognizant of Mr. Stickney's life for many years, and that he was not only an enthusiastic cultivator of the dahlia, but afterwards became equally interested in the culture of fruit, especially the pear. In this department he was a most careful observer, and a practical cultivator, continuing to ascend his trees after his friends thought it imprudent, on account of his age. He had frequent consultations with Mr. Wilder as to how he could best render material aid to the objects of the Society, which resulted in putting into his will a clause devising his beautiful estate in Watertown to the Society, for an Experimental Garden, an object deemed of the first importance by the founders of the Society. This provision stood for fifteen or twenty years, when Mr. Stickney became convinced that it would be wiser to bestow the contemplated gift in aid of the Library, and accordingly, in 1869, he established the "Stickney Fund." At the time of his death he had attained a greater age than any other member of the Society, except Dr. Jacob Bigelow and Cheever Newhall.

The resolutions were unanimously adopted.

On recommendation of the Executive Committee,

ROBERT M. BARNARD, of Everett,

was elected a Life Member, and the following named persons were elected as Corresponding Members:

DR. JOSEPH D. HOOKER, Director of the Royal Botanic Garden, Kew, England.

JAMES MCNAB, Curator of the Botanic Garden, Edinburgh.

J. LI DEN, Ghent, Belgium.

ÉDOUARD MORREN, Liége, Belgium.

Adjourned to Saturday, May 6.

MEETING FOR DISCUSSION.

W. H. Halliday read the following paper in continuation of that presented by him January 29th:

Wardian Cases and Ferneries. II.

BY W. H. HALLIDAY.

Plant cases, as we know them, are classed under two heads. First, the Wardian case, in which are grown foliage plants, ferns, etc.; plants too large or too coarse to look well in a small case. Although the first Ward's case was only a bottle, in which by accident Mr. Ward discovered that plant life could be sustained, from some cause or other we seem to have adopted the name Fernery for cases that are covered with a glass shade, in which only the more delicate or smaller varieties of ferns are cultivated. The schedule of this Society limits the size of the fern-case to fifteen inches in diameter.

In drawing a line between the Wardian case and fernery, the Flower Committee ruled out a case put up for competition, that was filled mostly with foliage plants, deciding that such plants were not admissible to a fernery, except when they were of such size and character as would not interfere with the general beauty and harmony of the whole, and then only in a small proportion to the number of plants used.

In this article I will endeavor to give some experience I have had with cases varying in size from four to fifteen inches in diameter.

The case may be made of tin, earthenware, or wood; it matters not which, so long as proper regard is had to drainage. This, as in Wardian cases, is of vital importance to the healthful growth of plants under the fern shade. I say this is of the *first importance*, as many persons who have the management of ferneries, use so little judgment in their care, that, without a proper outlet for water, the cases soon become perfectly sodden. I have seen more plants destroyed in cases, from the want of drainage and from over-watering, than from any other cause. Most of the failures I have met with have arisen from either too much water or too little light,

and frequently both combined; although the persons having them in charge have strenuously denied that any more water had been used than the plants required, and have insisted that they were placed in a very light situation. The light situation is usually quite a dark one; generally a space between two windows, with a dead wall back of it, or in a corner receiving a little light obliquely from a window two or three feet distant. When the plants are turned out, it is found that they have been treated as aquatics, and kept fairly up to their knees in mud and water. Then people wonder at their want of success.

The Hanging Fernery was my first attempt in this direction. I designed it to take the place of the hanging basket, which so seldom appears in good condition in the home. The case was turned from walnut, several pieces being glued and nailed together to get the proper depth, and also to keep the wood from warping. It tapered to a point at the bottom, to give lightness to its appearance. A zinc pan, with a rim to receive the shade, fitted the case loosely enough to be readily removed when watering was necessary. This case, as first constructed, was covered with a shade eight inches in diameter and ten inches high, and was suspended by silvered copper wire. The case first exhibited in this hall in June, 1871, had a shade twelve inches in diameter and fourteen inches high; was elaborately turned from maple and walnut, ornamented with ebony trimmings, and filled with the following named plants:—*Onychium Japonicum*, *Adiantum assimile*, *A. cuneatum*, *Selaginella Wildenovii*, *Panicum variegatum*, *Fittonia Pearcei*, *F. argyroneura*, *Lycopodium denticulatum var.*, and *Mitchella repens*, some lichens and wood mosses. It was awarded the Society's Silver Medal.

This case, when taken from the hall, was suspended in my window, where it received the morning sun for about an hour each day, and was not disturbed again till January, excepting when it was occasionally turned to the light. It was then a mass of green. I noticed considerable soil on the glass, carried up by slugs in their nocturnal rambles; also some decayed fronds of the *Adiantum*. Altogether it was as much of a success as a close case could be, and would probably satisfy most people who grow plants for home decoration.

There are some plants that seem better suited to a close case than to any other situation. They are confined chiefly to the Lycopods and Selaginellas. Many of them are very beautiful, rivalling,

and in some cases closely resembling, their allies, the ferns, in beauty of form and delicate, feathery appearance. They make superb specimens, grown singly under a shade; and I consider this the most satisfactory way to grow them, having the case large enough to fully develop their beauty of form and habit. Their growth is generally quite rapid, and to any one who delights in a well grown plant, the culture is worth trial. *Selaginella Lyallii*, *S. Africana*, *S. plumosa*, *S. umbrosa*, and *S. triangularis*, make quite large plants and are erect in habit. There are many others usually found in plant catalogues, and as far as I have tested them all are eminently fitted for close cases, and their growth is much more rapid than when grown outside. I usually combine them with ferns in the arrangement of a case, and think the effect is much better for the combination.

The *Fittonias* are another class of plants which are favorites with me. Their bright crimson and silver veinings are a great acquisition to the fernery, lighting it up wonderfully, and seemingly never out of place, no matter what the size of the case may be. They also make superb plants by themselves. I once had a plant of *F. gigantea* which filled a shade twelve inches in diameter and fourteen inches high. It was the finest plant of the kind I ever met with. Its habit became erect, and the color of the foliage seemed very much more brilliant than we ordinarily find it. But the variety is too coarse to be grown satisfactorily with small ferns. The Wardian case is the more suitable place for it. *F. Pearcei* is the best for all purposes; being a vigorous grower, a mere scrap soon produces a good plant, and it will live under almost any treatment in a close case. Its habit is not so recumbent as when grown without. *F. argyroneura* is very beautiful, but it has one fault,—that of damping off when it is chilled, thus spoiling it for winter use, unless in a very warm situation, but it is just the plant for summer use. There are so few plants of a white or silvery appearance suitable for this purpose, that I use the *Fittonia argyroneura* as long as the foliage will hang together, and then replace it with something else.

A few weeks since, I had the good fortune to be shown a plant of *Todea superba*, growing in a Wardian case. The case was about two feet square, and as many feet high, with a flat top. A pan about eight inches in diameter, filled with this truly superb plant, in vigorous growth, occupied the centre. Other filmy ferns were

planted out in the case, but this, the grand object of the whole, was elevated several inches above the others, showing conspicuously its full beauty. An English author says of it, "Delicate and fragile, with its semi-transparent fronds, it looks like tufts of the most beautiful sea-weed, plucked from the decorations of a mermaid's ocean home." I have seen larger plants of this species, but none in such fine condition. It was grown in a cool room, near a west window, the light partly obscured by a drawn shade. This plant is just the thing for a large fern shade, as it needs as little air as the *Selaginellas*, very little light, and a cool situation, and when once established needs but little attention. The filmy ferns are eminently fitted for growing singly in cases by themselves. The only objection is the expense of many of them, but I would rather have one plant of *Todea superba* than dozens of ordinary ferns.

The great difficulty I have always found in ferneries, is to reach the plants after they have filled, or partly filled the case. It is easy enough to remove the shade; but to replace it, so that the plants may retain their former position, is not so easy. This is so with regard to delicate ferns; the fronds will tip about, look out of place, and otherwise mar the arrangement. If you could only reach them from the top, all would be remedied very quickly. Frequently I have been forced to allow a large slug to have his own way, rather than disturb the shade when the case was looking finely; and in many instances, have allowed decayed fronds to remain, rather than run the risk of destroying the arrangement by removing the shade. It was almost as much on this account as for ventilation, that I constructed the dome top or ventilated fern case, which is as easily managed as an ordinary Wardian case. Lifting the dome does not disarrange the plants, as they are all confined within the cylinder, which need never be disturbed for this purpose. This case is constructed as follows:

The case or stand is of wood, six inches deep, and resting upon three small feet. There is a large opening underneath, covered with a movable slide to admit or exclude the air. It has a zinc pan one-half an inch less all round than the wooden case. This half-inch space is covered all around at the top of the pan, which leaves a flat surface of zinc, one inch wide, with an outside rim to receive the glass cylinder. This flat surface of zinc is pierced

with half.inch holes in its entire circumference about three inches apart. When the glass cylinder is in place, the half-inch holes are inside the case. The cylinder, of annealed glass, fits neatly into the zinc rim, and is fifteen inches in diameter by fourteen inches in height. Encircling the upper edge of the cylinder is a copper rim, one inch wide, with edge turned downward on the outside, a quarter of an inch wide, to fit on to the cylinder. The flat surface of the rim is perforated with quarter-inch holes, and the inner edge turns up a quarter of an inch, to receive the dome or cover, which is eight inches high and twelve and a half inches in diameter. The holes in this copper rim are on the outside, so that when the valve in the bottom of the case is open, the air passes up through the holes round the zinc pan, and out at the copper rim. The whole case when complete stands twenty-nine inches high from the table.

This case was first exhibited in 1873, and was filled at that time with *Onychium Japonicum*, *Adiantum cuneatum*, *A. assimile*, *Panicum variegatum*, *Selaginella Wildenovii*, *S. stolonifera*, *S. Martensii*, *Fittonia Pearcei*, *F. argyroneura*, and *Lycopodium denticulatum var.* A perforated cocoanut shell, filled with *Adiantum assimile*, was suspended from the top, giving completeness to the whole. This case is quite an expensive one, and can never become popular on that account; but for convenience in the management and culture of plants it has no rival. It received the Society's Silver Medal at the time of the first exhibition.

Generally, too many and too large plants are crowded into the fernery, giving it a heavy and unsightly appearance, and filling the shade completely at the outset, without room for further growth. *Dracœnas* and other plants of this kind make a fine display in the Wardian case, but are certainly out of place under a glass shade. I know it is very difficult even for those too who are not wanting in taste in other matters to understand this.

There are very few foliage plants that can be introduced into the fernery. I would recommend only plants of dwarf habit, such as *Reineckea carnea var.*, with grassy foliage, green and white; *Panicum variegatum*, a very pretty grass, with pink, white, and green foliage; and a small variety of *Bambusa Cyperus alternifolius var.* is quite pretty when a small plant, but the growth is almost too rapid for a fern case of ordinary size. The foliage is light and graceful and contrasts prettily with ferns. It is a charming plant for the Wardian case.

Rockwork in a case of the size just described, has a very pretty effect when well arranged. This is a difficult matter to accomplish and I generally prefer the case filled with plants rather than rocks, though for variety I occasionally introduce them. I use coke and pumice stone soaked in water, and sprinkled with cement to give color. These substances are very light and answer the purpose well. Quite small plants only are fit to be used with the rocks.

I have had this ventilated case filled with the following named plants, and the effect was highly satisfactory: *Nephrolepis exaltata*, *Adiantum colpodes*, *Onychium Japonicum*, *Selaginella umbrosa*, *S. Wildenovii*, *Panicum variegatum*, *Lycopodium denticulatum var.*; near the glass *Fittonia Pearcei*, *F. argyroneura* and *Peperomia maculosa*, and suspended in the shell a plant of *Selaginella cœsium*. This last is the prettiest basket plant I have ever used for summer decoration.

Among our native plants are many charming ferns that will soon accustom themselves to the confinement of the case. *Asplenium ebeneum* and *A. trichomanes* are very pretty ferns for rockwork; *Adiantum pedatum* is a lovely fern for a case, but requires rest in winter. *Polypodium vulgare* is pretty by contrast with those more delicate. There are several *Selaginellas* which will soon become quite at home in the fern case, and will be valuable acquisitions. *Equisetums* are pretty, and so different in their character and foliage from other plants, that one would hardly wish to be without them. Almost anywhere in the woods and swamps, beautiful and delicate plants may be found that will grace any fernery. Many gems are often discovered in this way. A favorite of mine is the *Mitchella repens*, or partridge berry vine, which takes readily to the close case, its bright red berries remaining perfect in their beauty for a long time. This plant always produces a wonderful effect, and there is nothing prettier for any case, no matter with what else it may be filled.

Management. — In the selection of a fern case I should choose one with an outlet for drainage. This I have already said is very essential, especially for a novice. If there is no drainage, water must be used *very sparingly*. Crocks and small pieces of charcoal, covered lightly with old moss to keep the soil from sifting down through, are the best for drainage. I prefer a case constructed of wood. For a case that will require a shade twelve or

fifteen inches in diameter, take three pieces of plank—walnut or other hard wood—two inches thick; fasten them securely together with glue and screws, forming a solid piece of wood six inches thick. The inside of this piece of solid wood is to be removed by the saw, leaving only a rim to support the zinc pan which is to contain the soil. This wooden rim, which is to be turned in finishing, can be ornamented if you wish. The case when complete will last for years. The heat and dampness will not affect it, provided no water is thrown over it. A zinc pan, with an opening in the bottom for drainage, fits into the wooden case. The pan is made with a rim to receive the shade; this will prevent water from coming in contact with the wood. This wooden case will cost about double the price of one made of earthen or lava ware; but it presents a better appearance in the room, and there is no trouble from scaling off or cracking, as is often the case with earthen ware. Very few of the latter are properly constructed for drainage; therefore I would recommend a wooden case. The larger the case, the more satisfactory it will be. Frequently in selecting a case one has to be guided by the space he can afford for it; but I should say the larger the case the better. I have had cases no larger than four inches in diameter, but of course they were mere toys, though better than none, if you have space for one no larger.

If you have a wooden case designed for a shade fifteen inches in diameter, make it six inches deep. This will give you two inches of drainage, and four inches of soil, in which can be grown any plants suitable for a case of this size. Most of the earthen fern cases are not more than four inches deep: this depth will answer for those of small size, but it is not sufficient for larger ones. The soil and method of planting recommended for Wardian cases are suitable for ferneries: also the same general treatment will answer for a ventilated fern case.

A fern case for winter decoration ought to be filled in August, or not later than the first of September. This will give the plants time to get fairly established, and make new growth for the winter, before the short, cold days commence. Cases filled later in the autumn afford very little satisfaction or pleasure, as they rarely get underway, or begin to make new growth, until spring, if they do not wholly die out during the winter. Were I intending to fill a case for my own use I should certainly plant early.

For the close case, I should only use such plants as are suitable.

Disturb the shade only when water is required, or signs of mould are visible, or the plants damp off; then give air for a short time each day, wiping out the glass when it is removed; this will generally remedy the trouble when practised a few times. When the plants are in vigorous growth, and during the warm weather, give considerable water, but withhold it almost entirely during the winter, and give plenty of light at all times.

Discussion.

No discussion of Mr. Halliday's paper was held, but the subject of the last meeting—chemical fertilizers—was again taken up.

John B. Moore said that the subject was a most important one to farmers and market gardeners, and he thought Mr. French's paper on the whole a very good one. Our main reliance must always be on barnyard and stable manure; the chemists will tell us that that is the most perfect manure, and this will generally be accepted. But, except in the neighborhood of large cities, no market gardener who depends on this alone can raise his crops, and consequently it must be supplemented with fertilizers, or we cannot have the highest farming. All of us have used the so-called superphosphates in years past, and all of us have been humbugged with them. Their failure was due to two causes—improper manufacture and fraud. They are better now, for the law compels every manufacturer to mark on his packages the quantity of each of the ingredients, and this enables any man of common sense to tell about what he ought to pay for the contents.

Professor Stockbridge's idea is almost the same as that of M. Ville—if there is anything new it is the exact specification of quantities. Prof. Stockbridge claims to raise a certain quantity of corn and stover more than the natural product of the land, and he assumes that the fertilizers which he applies to produce this result will, almost to a certainty, be all taken up by the crop, but Mr. Moore believed that, however carefully they were incorporated with the soil, some of them would not be used by the plants. Prof. Stockbridge claims also that the soil is left in better condition after applying the fertilizers and taking off the crop, but this would seem absurd, unless the powerful salts used have liberated fertilizing substances already contained in the soil. Mr. Moore said that he had himself doubled a crop of rye by applying guano,

and it would seem that the land should have been growing better, but it did not. Prof. Stockbridge would say that he had not put in the proper substances, but if we take away seventy bushels after applying only the necessary food for fifty bushels, it would seem strange that the soil should continue to grow better.

One of the worst things about these fertilizers was the patent, and it could not be denied that the Agricultural College had indirectly endorsed it. The speaker had the success of the college much at heart, but it is not what it should be, and some of the greatest injuries it has received have been at the hands of its friends. Prof. Stockbridge, while in the service of the Agricultural College, has made experiments, for the results of which he takes out a patent.

H. Weld Fuller said that he knew very little about the Stockbridge fertilizers, but he was a friend to fertilizers properly used; yet it appeared to him that there is a fallacy in these formulas. They assume that all soils are alike, and are to be dosed alike for the same result. They presume too, that the product will be just in proportion to the fertilizers added. Now we know that soils are not all alike; that each soil has its own power of absorbing, elaborating, and assimilating its food, and that the product is not always in proportion to the fertilizer. The plant therefore should be supplied with the food which it needs for its special service. Its growth is restricted to the *minimum* of any one of its constituents. Any excess of other materials will not add to the product, but may often do harm. We have long known what are the elements of our different crops. Corn, cotton, potatoes, and tobacco have been analysed a thousand times, and Liebig, Johnston, and several others have told us what there is in oats, peas, beans, and barley; but who has told us just what our own particular soil contains, and its power of absorbing and appropriating what we supply? There, probably, is never any lack of nitrogen, for the air and earth are full of it; nor is carbon lacking—air, rain and dew, and the processes of nature keep up an inexhaustible amount. Some soils, however, cannot make it energetic, and even an inferior material may increase the action in the soil; yet here we have a set formula to apply to every soil. By it you may add what you have already in abundance or excess. If I owe a hundred dollars and know that I have fifty dollars, it is a fair deduction that fifty are wanted. But if I have a hundred dollars to pay, and know noth-

ing of my resources, the Professor says "provide the whole." This process seems to be about what Prof. Stockbridge has patented. He does not tell us how much we have on hand or what we are to expect from the operations of nature. The only thing new in this patent seems to be its absurdity. Mr. Fuller said he should be sorry to feel that President Clark had fully endorsed these formulas, for he considered him one of the foremost men of the State in agricultural pursuits, and his experiments on the flow of sap and the power of plant-growth had given him a just fame, and greatly elevated his college. He feared that, whatever may have been the motive of Prof. Stockbridge in patenting these formulas, they would not increase the popularity of that institution.

The constituents of plants are organic and inorganic; all that will not consume are inorganic, and it is only these that we undertake to supply. Some soils have a great excess of some constituent. In Hungary, it is said, there are soils from which alternate crops of cotton and tobacco have been taken for centuries, without exhausting them. Prof. Stockbridge's formulas for these crops contain the same ingredients as for others, with the addition of lime and magnesia. The growth depends not so much upon what goes into the soil and what is taken out, as upon the substances which enable the plants to appropriate what is nutritive in the soil. These substances must have a certain form and condition and relation to each other, to become available. The inorganic constituents of plants are but from one to fourteen per cent. of the whole—commonly about five per cent.—and the air furnishes all the carbon and all the residue. Moisture, warmth, and air—heat and sunlight and chemical adaptations—are the conditions for development. The physical condition of the soil—its pulverization and exposure of parts—produce chemical changes, and are often very essential to production. True art in agriculture appears to consist in adopting proper means to make the most of what the soil contains, and in enabling the elements of the soil to coöperate in assimilating the food. Soils equally productive differ greatly in their chemical composition. By an excess of any element you may harm the plant. If, for example, there is too much of a soluble salt in the soil, after a rain the plant will absorb so much that, in case of hot weather following it, the evaporation from the leaves will be more rapid than the assimilation, and a white crust or powder is left on the surface and the plant sickens in consequence.

You may sometimes benefit the soil by reducing its chemical elements, as when you mix carefully sand with clay; and clay, merely by calcination and separation, becomes energetic and productive.

In cultivated grounds, if we know what crops have been last removed and what manures have been added, we can generally tell what to apply. We must study well the natural characteristics of the soil, and learn its composition, and find its wants. He did not make these remarks in opposition to chemical fertilizers, for he believed in them; they will, if appropriately used, provide what we need and cannot otherwise obtain.

William H. Bowker said that he wrote to Prof. Stockbridge to enquire about the patent, and read the following extract from his reply:

"AMHERST, March 31, 1876.

W. H. BOWKER:

Dear Sir,— * * * Until within the last four months the thought of getting a patent never occurred to me. My only thought was that if these things were absolute facts it would, in the matter of artificial fertilizers, make the practical farmer independent of the manufacturer and commercial dealer. He would be able to purchase the substances and compound them by the formulas which I had published, or given freely to every one who asked for them. It was only when it was fully developed that farmers generally would not pursue that course, but wanted the formulas compounded ready for use, and that a score of individuals in different sections were intending this year to engage in the manufacture and sale of fertilizers by the Stockbridge formulas, that I felt it my duty (as it was undoubtedly my right) to interfere, and by a patent retain control of the matter for my own credit and the interest of the great mass of farmers.

Now what is the patent? An examiner in the Patent Office prepared it for me, and in the manuscript he wrote 'manufacture, sale, and *use*.' On reading it over I told him I did not wish to patent the *use*—that should be left free. He took his pen and struck out the word *use*. The document went through the necessary stages in the office, and the patent was granted. When, however, I received the 'Letters Patent' I found it was headed in the set printed form of the office and the word *use* was in it, and though I did not want it, my patent is for the '*manufacture, sale, and use*.' But I declare that the use of these formulas is and shall be as free to the

farmers of Massachusetts as the springs of their hills, and they may go where they choose to buy their materials, and do their own compounding. And with equal earnestness I declare, if there is any force in law, no man shall have the privilege of manufacturing these fertilizers unless he is under my control, to the end that no such fraud and scoundrelism shall be practised on farmers in this, as have been practised in the case of some fertilizers.

LEVI STOCKBRIDGE."

Mr. Bowker added that he did not assume to defend Prof. Stockbridge or his formulas. That the Professor was fully able to do. He thought Mr. Moore's remarks very fair and candid, and fully agreed with him that barnyard manure is the best of all fertilizers, in that it seemed to be adapted to all plants, and also had a wonderful mechanical and chemical effect upon the soil. But the supply is not equal to the demand, and the question is, how shall we supplement it? It is impossible to know just what we have in our soils, but Prof. Stockbridge assumes that they are barren, and applies what each crop requires, thus really feeding it as you feed your animals. Is it not better, knowing what plants require, to apply those substances, than to keep on in the hap-hazard course which we have heretofore pursued, applying this thing and that, regardless of their wants? The formulas do not pretend to be infallible, and with further experience will probably be modified. With reference to Peruvian guano—that contains an excess of nitrogen and phosphoric acid, but only a small percentage of potash. Is it not better, therefore, to apply a fertilizer containing all the elements needed by plants, than a fertilizer deficient in either? The reason farmers have thought that fertilizers exhausted their soils, is that they were deficient in one or more of the elements of plant food, while containing an excess of others.

Marshall P. Wilder said that our motive in discussing this subject should be to treat it fairly, and he was very glad to hear Mr. Bowker say that Capt. Moore had done so. He was at first displeased with the idea of patenting these fertilizers, believing that the public were entitled to all the information that could be acquired by the College, but on reflection he found that Prof. Stockbridge's patent only precluded the selling of these fertilizers under his name and as prepared by him, and that no one would be prevented from buying the ingredients and mixing them for his own use.

The question for us to solve is, how much each plant needs, and how much we shall apply, and he hoped that every gentleman present would apply these fertilizers which have been recommended by Dr. Sturtevant, Dr. Burnett, and Mr. Bowditch, and report the results. He believed Mr. Moore to be one of the firmest friends of the Agricultural College. Notwithstanding its imperfections there is not another institution of the kind on the continent that will compare with it. If it has been drawn into the support of these fertilizers it is very unfortunate.

Mr. Moore expressed the opinion that chemical analyses of soils are extremely deceptive. With his powerful agents the chemist will find potash in a soil when plants cannot possibly find it. If a farmer has an analysis made of a sample of his soil he cannot be sure that it is an average specimen, and if he takes a little here and a little there how is he to make a prescription to suit the different portions of his ground?

Leander Wetherell, alluding to the experiment in applying guano to rye, mentioned by Mr. Moore in his previous remarks, asked why, if the guano contained all the elements of the rye, it did not continue to grow rye year after year?

Mr. Moore believed that there was something in the growth and vital action of plants beyond the reach of any analysis that the chemist had yet made.

Josiah W. Talbot remarked that all chemists acknowledge that rye needs potash, and that probably the failure of Mr. Moore's rye was owing to the fact that the guano supplied none. Prof. Stockbridge puts in all the elements needed.

Mr. Moore asked how it would be supposing there was plenty of potash in the soil.

Mr. Talbot replied that if there was plenty of potash, in a state to be taken up by the roots of the plants, there would be no need of adding it, but if he could get a crop of rye by applying potash in addition to other elements, he would be the gainer. In regard to the patent, it is only intended to prevent dishonest persons from mixing up a lot of spurious substances and selling them as the Stockbridge fertilizers; that is all there is about it, The formulas furnish what the people want, and though they may not be new they are not the less valuable. Prof. Stockbridge says that here are formulas which will produce certain definite effects, and in ninety-six cases out of a hundred where they have been tried they

have proved successful. He deemed their beneficial effects much less dependent upon the character of the season than some of the previous speakers thought. In an unfavorable season they would give the plant a start which would be a great assistance in overcoming injurious influences. He thought that the use of these fertilizers would add twenty-five per cent. to the value of our poor lands.

Mr. Fuller asked whether any one ever heard of a general prescription for sick men, without regard to their condition or needs. He did not think it practicable for every farmer to employ a chemist to analyze his soil; even analysis would be defective and only approximate the truth, because the nutritive substances in the soil, to be available and effective, must have certain relative forms and conditions, still unknown. But every farmer knows at least, whether his soil is full of lime, or sand, or peat, or clay, and whether it is wet or dry, and its common aspect. He can then determine how to treat it. But is it not a fallacy to assume, as Prof. Stockbridge does, that all soils are barren? If all we need for a clay field is tillage, sand, and air, why should we buy and put into it all the elements he prescribes? Chemical analysis shows that pipe clay has all the elements of a fertile soil, and yet it is one of the most barren, because it is too compact and has not the capacity to take from the air the oxygen and carbonic acid needed by plants, and to allow fine roots to penetrate it; but by calcination such soils become fertile. Will his fertilizer effect this? And ought we to waste our money for things not needed? All his formulas embrace nitrogen, potash, and carbonic acid—excellent things in their proper place; but all of these cannot always be wanted, nor can they be often wanted in such quantities as he has prescribed, for all soils are not barren or alike.

Charles M. Hovey said that both Mr. Fuller and himself had fallen into the same train of thought. He had discussed this subject many years ago in the "Magazine of Horticulture." He thought a chemical analysis of a soil entirely unnecessary to a man of good judgment. Mr. French, in his paper, had stated that the fertile soils of the Scioto valley, by analysis appeared scarcely different from the fertile soils of New England. All cultivators of plants in pots believe that a virgin loam is necessary to success. Much depends on the physical and mechanical condition of the soil; it must be aërated as well as enriched, and Mr. Hovey

thought Jethro Tull, who believed that deep and thorough tilling of the soil would supersede the necessity of manure, was nearer the truth than some of our modern professors with their chemical fertilizers. We have been told that only four persons failed out of a hundred who used the Stockbridge fertilizers last season, but those who did not fail have not told us what good, deep, thorough tillage would do on the same soil without fertilizers. The published experiments were, too many of them, *ex parte.*

Leander Wetherell read from an address by Prof. Stockbridge, as given in the "Report of the Secretary of the Massachusetts Board of Agriculture for 1875–6," p. 23, and said that he could not see in this anything short of rendering barnyard manure nearly valueless. Prof. Stockbridge only uses three elements for all crops, like the doctor who prescribed calomel and bleeding for all his patients. Mr. Wetherell also quoted from the "Scientific Farmer" for December, an account of the application of the Stockbridge formula to a crop of grass which produced 1,950 pounds per acre more than the natural yield of the land. He had some land just in condition to use this formula, and he intended to give it a trial, though he had not much faith in it. Who can tell, when the increase in the crop is attributed to the three ingredients named in the formula, that it was not due to the sulphate of lime in the superphosphate? He could tell a story of a much greater increase in a crop of clover, than that in the "Scientific Farmer." He knew a piece of land which had been ploughed for seventy years, and was then sowed to clover, with gypsum, and produced three tons of cured clover to the acre, while a corner left without the gypsum produced only at the rate of one ton to the acre. It is recommended in using the Stockbridge formulas to leave three rows without the fertilizers, for comparison, but when the roots are running all through the ground, how can we know that they do not feed on the fertilizers? There is a looseness about these experiments that brings them within the domain of doubt. When you have applied the fertilizers, are you sure that the plants will take up every particle?

The President announced that this would close the series of meetings for discussion this season.

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TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1876.

PART II.

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Massachusetts Horticultural Society.

SATURDAY, May 6, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The President read a letter addressed to him by William Gray, Jr., presenting to the Society a copy of Alphand's "Les Promenades de Paris," and stated that this was the most valuable single work ever presented to the Society.

Voted, That the thanks of the Society be presented to Mr. Gray for his generous gift.

On motion of the Chairman of the Library Committee, the Librarian was authorized to have the volumes presented by Mr. Gray, bound.

The following named persons, having been recommended for membership by the Executive Committee, were severally elected:

HUGH MORRISON, of Gloucester.
THOMAS C. THURLOW, of Newburyport.
AARON DAVIS CAPEN, of Mattapan.
JOHN J. RICHARDS, of Boston.
LEONARD W. WESTON, of Lincoln.
FREDERICK MARSHALL, of Everett.
DR. HENRY P. WALCOTT, of Cambridge.

The Secretary read a letter from Dr. Jared P. Kirtland, of East Rockport, Ohio, an Honorary Member of the Society, giving an account of a curious hybrid between the Western Shag-bark and the Black Oak. The letter was referred to the Committee on Publication.

Adjourned to Saturday, June 3.

BUSINESS MEETING.

SATURDAY, June 3, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The Committee to nominate a candidate to fill the vacancy in the Committee on Gardens, presented the name of James Cruickshanks, and he was unanimously elected. It was voted that the Committee on Gardens have leave to elect a Chairman.

The following named persons, having been recommended by the Executive Committee were, on ballot, duly elected.

FRED W. KELSEY, of Waverly, N. Y.
MAHLON D. SPAULDING, of Boston.
WILLIAM GRAY, 3d, of Boston.

Meeting dissolved.

BUSINESS MEETING.

SATURDAY, July 1, 1876.

A duly notified stated meeting was holden at 11 o'clock, President PARKMAN in the chair.

Hervey Davis, from the Committee on Gardens, announced that that Committee had elected Joseph H. Woodford, Chairman.

Charles M. Hovey offered the following resolutions: —

The members of the Massachusetts Horticultural Society having learned with deep regret of the decease of Louis Van Houtte, of Ghent, Belgium, the eminent horticulturist, and a Corresponding Member of the Society: therefore,

Resolved, That in this event we recognize that overruling Power, who lets not even a sparrow fall without his knowledge.

Resolved, That the death of M. Van Houtte has left a void in the ranks of horticulturists, which it will be difficult to fill.

Resolved, That cultivators throughout the world recall with the greatest pleasure the energetic efforts of M. Van Houtte in the domain of horticulture; that to his extensive knowledge of plants,

his unremitting labors in their culture, his enthusiasm in their introduction, his unceasing efforts in the production of new varieties, and his earnest endeavors to popularize and render familiar a science so deeply promotive of pleasure and refined culture, all lovers of beautiful plants owe a debt of the deepest gratitude.

Resolved, That as a botanical traveller, as a zealous introducer of new plants, as a skilful cultivator, as the proprietor and director of the most extensive collection of plants in Europe, and as the author and editor of that most beautiful work, the "Flore des Serres," M. Van Houtte has made rich use of his talents, for horticultural advancement everywhere. As a patriotic citizen, and an upright, honest, and sincere man, his death will carry grief to every member of our association.

Resolved, That we tender to the family of the deceased our sympathies in their great bereavement.

Resolved, That these resolves be entered upon the records, and that a copy, in French, be forwarded to the family of the deceased.

Mr. Hovey added that in his horticultural labors M. Van Houtte was aided by the Belgian government in a manner entirely unknown to nurserymen here, yet, even making every allowance for this assistance, his achievements were extraordinary. Everything new seemed connected with him, — his was the great place from which has emanated almost everything new, not only of his own introduction, but everything originated or collected by others. It was very rarely that he sent out anything not of value, and he sometimes incurred the ill will of other nurserymen by condemning novelties which did not come up to his high standard. His establishment made Ghent a centre of horticultural interest. Mr. Hovey alluded to the many eminent horticulturists who had passed away since his recollection, — Knight, Van Mons, Loudon, and now Van Houtte, who has added so much to our gardens and pleasure grounds, — a man of rare talents, beloved by every one. In his early days, he was a botanical traveller in Brazil, and later he had a share in the establishment of the present liberal and enlightened government of Belgium. Mr. Hovey concluded by expressing his regret that Col. Wilder, who visited M. Van Houtte's establishment not many years ago, was not present to speak of him.

Edward S. Rand, Jr., in seconding Mr. Hovey's motion, said that he had hoped some one personally acquainted with M. Van Houtte would be present to perform that service. But, though he

had not the pleasure of a personal acquaintance, he had had much correspondence with M. Van Houtte, and his letters were extremely interesting. Of late years he had given special attention to raising new varieties of gesneraceous plants, having acres of seedling gloxinias, of which he did not expect more than one in a thousand, or even one in ten thousand, to be of value. The last letter received from him by Mr. Rand, about two months previous, gave no premonition of his approaching end. He was one of the judges at the International Horticultural Exhibition which opened at Brussels on the 30th of April, and, though in ill health, performed the duties of that office. Mr. Rand concluded by presenting to the Society a copy of the addresses delivered at the funeral of M. Van Houtte.

The resolutions were unanimously passed.

Adjourned to Saturday, August 5.

BUSINESS MEETING.

SATURDAY, August 5, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

Agreeably to the Constitution and By-Laws, the President appointed the following named gentlemen a committee to nominate suitable candidates for the various offices of the Society: William C. Strong, Chairman, C. O. Whitmore, John G. Barker, John C. Hovey, C. M. Atkinson, J. H. Woodford, Waldo O. Ross.

AMOS STONE, of Everett,

was duly elected a member of the Society.

Adjourned to Saturday, September 2.

BUSINESS MEETING.

SATURDAY, September 2, 1876.

An adjourned meeting of the Society was holden at 11 o'clock. The President and Vice Presidents being absent, Charles M. Hovey was chosen President, *pro tem.*

John G. Barker, from the Committee on Nominations, reported a printed list of candidates for officers for the ensuing year.

Invitations were communicated, by the Secretary, from James H. Ricketts, of Newburgh, N. Y., to visit and examine his new seedling grapes; and from Alexander Whilldin, President of the Sea Grove Association, to attend the National Forest Convention, under the auspices of the American Forest Council, at Sea Grove, Cape May Point, N. J., September 7th and 8th, 1876, for the promotion of forest planting.

The thanks of the Society were voted for these invitations.

The following named persons, having been recommended by the Executive Committee, as members of the Society, were on ballot duly elected:

Mrs. J. W. Walcott, of Boston.
Charles J. Anderson, of Longwood.

Meeting dissolved.

BUSINESS MEETING.

Saturday, October 7, 1876.

A stated meeting of the Society, being the annual meeting for the choice of officers, was holden at 11 o'clock, President Parkman in the chair.

The Recording Secretary stated that due notice had been given of the meeting, in accordance with the Constitution and By-Laws.

The President appointed E. W. Buswell, John G. Barker, and John C. Hovey, a Committee to receive, assort, and count the votes given, and report the number. The polls were opened at ten minutes past eleven.

The following named persons, having been recommended as members by the Executive Committee, were on ballot duly elected:

D. R. Beckford, Jr., of Marblehead.
Alfred J. Edmonds, of North Easton.
Mrs. L. P. Weston, of Danvers.
O. B. Hadwen, of Worcester.
H. A. Lothrop, of Sharon.
Otis Hinman, of Chelsea.

The polls, for the election of officers, were closed at ten minutes past twelve. The Committee reported the whole number of votes to be 93; necessary for a choice 47, and that all the gentlemen named on the ticket presented by the Nominating Committee had that number and were elected.

Adjourned to Saturday, November 4.

BUSINESS MEETING.

SATURDAY, November 4, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

A letter was read from John C. Chaffin, conveying his declination to serve on the Committee for Establishing Prizes, and C. M. Hovey, W. C. Strong, and John Robinson, were appointed a Committee to retire and report the name of a candidate for the vacancy, to be voted for at this meeting. The Committee subsequently reported the name of P. B. Hovey, who was unanimously elected.

The President, as Chairman of the Executive Committee, reported a recommendation that the following named amounts be appropriated as prizes for the year 1877, and stated that the reduction in the sums was caused by a diminution in the income of the Society:

For Flowers, ...	$3,000
Fruits, ...	1,900
Vegetables, ...	1,000
Gardens, ...	200
Total, ...	$6,100

W. C. Strong, from the Committee to whom was referred the subject of an award to Edward S. Rand, Jr., for his services to the Society as Recording Secretary for the past eight years, reported, recommending the presentation to Mr. Rand of a silver salver of the value of one hundred dollars. The report was accepted.

Charles M. Hovey presented the following resolutions in memory of John Fisk Allen, and moved their adoption:

The Society have learned with deep regret of the decease of John Fisk Allen, of Salem, a member of the Society: therefore,

Resolved, That by his death the members are reminded of the

active labors of the old members in the early days of the Society, and particularly of those of Mr. Allen, who, in his specialty of grape culture, was highly instrumental in encouraging and extending the growth of fine grapes.

Resolved, That to his enthusiasm and labors we are indebted for some of our best hybrid grapes, his exertions in their production stimulating others to like attempts, and we may date the interest in the production of new grapes from his early efforts in that direction.

Resolved, That as the first person to introduce and cultivate that magnificent lily, the *Victoria regia*, in our State, he achieved the highest success, and contributed both to the pleasure and instruction of the citizens of his native city, as well as to that of the members of this Society, before whom it was exhibited, and to that of the lovers of beautiful flowers every where.

Resolved, That the sympathies of the members be extended to the bereaved family, and that these resolutions be entered upon the records of the Society.

Mr. Hovey remarked that the circle of cultivators contemporary with Mr. Allen, was narrowing, and spoke, also, of the folio volume, illustrated with beautiful plates, in which the results of Mr. Allen's culture of the *Victoria regia* were recorded, the copy of which, now in the library of the Society, was presented by the author.

Robert Manning seconded the resolutions, and spoke of the liberal contributions made to the exhibitions of the Society, in years past, by Mr. Allen, it being no unusual thing for him to place on the tables, at one time, twenty or more varieties of grapes, and the latest specimens from his retarding house being scarcely gone before those from the earliest forcing house came in. He also alluded to Mr. Allen's continued interest in the Society, as manifested by occasional visits long after failing health precluded him from taking an active part in its work. The last of these visits was on the 30th of September, when he presented specimens of a seedling grape; and, in answer to an inquiry by Mr. Manning, stated that he had tested in his houses four hundred varieties of the European grape, which was believed to be a greater number than have been tested under glass by any other cultivator in the world.

John Robinson spoke of Mr. Allen's culture of the *Victoria regia*, and of his vivid recollection, as a boy, of visiting the house where that wonderful flower was growing.

William C. Strong remarked that at the time when Mr. Allen was so largely engaged in fruit culture, a prize was offered by the Society for the best display of fruit during the season, which was taken year after year by Mr. Allen, who exhibited not only grapes but forced cherries, peaches, and nectarines; figs, pineapples, pears, etc. Mr. Strong said that we have no such zealous cultivator of the grape among us now, and that we have occasion to hold Mr. Allen's memory in grateful remembrance.

James Cruickshanks spoke of the time when he heard of Mr. Allen's success in the cultivation of the *Victoria regia*, and went down to Salem to see it, and said that he should never forget the kindness and attention shown him by Mr. Allen.

The resolutions were unanimously adopted.

Adjourned to Saturday, December 2.

BUSINESS MEETING.

SATURDAY, December 2, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The part of the Schedule of Prizes relating to Flowers and Fruits was presented by the Executive Committee. The part relating to Vegetables and Gardens was not ready.

Hervey Davis, Chairman of the Committee for Establishing Prizes, stated that a question had arisen in regard to the construction of the words "a public trial" in the offers of Prospective Prizes, and asked the ruling of the Society thereon. The subject was fully discussed by C. M. Hovey and John C. Hovey, who argued that an exhibition on the tables of the Society for the specified time would meet the requirements of the rule; and by W. C. Strong, P. B. Hovey, J. H. Woodford, and F. W. Kelsey, who took the view that new seedlings should be publicly distributed and tested by others than the originators before receiving a Prospective Prize. After several motions had been submitted and withdrawn the subject was, on motion of Mr. Davis, referred to the Executive Committee.

The Chairman of the Committee on Plants and Flowers was allowed another week to complete his report.

J. H. Woodford, Chairman of the Committee on Gardens, read the Annual Report of that Committee.

Benjamin G. Smith, of the Committee on Fruits, read the Annual Report of that Committee.

C. H. B. Breck, Chairman of the Committee of Arrangements, read the Report of that Committee.

Charles N. Brackett, Chairman of the Committee on Vegetables, read the Annual Report of that Committee.

These reports were severally accepted and referred to the Committee on Publication.

Adjourned to Saturday, December 9.

BUSINESS MEETING.

SATURDAY, December 9, 1876.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The President, as Chairman of the Executive Committee, reported the Schedule of Prizes for 1877, with the approval of the Committee.

Also, in regard to the subject referred to the Committee at the last meeting of the Society, reported that it would be for the interest of the Society that the strictest construction be placed upon the words "a public trial," and that any product offered for a Prospective Prize should have been tested by the public.

W. C. Strong moved that the report be accepted and laid on the table. The motion was seconded by C. M. Hovey, with the understanding that the construction reported by the Executive Committee apply to the awards concerning which the question had arisen.

E. S. Rand, Jr. made a personal explanation of his position with regard to the Prospective Prize awarded to him.

Mr. Strong declined to accept Mr. Hovey's amendment, and after some remarks by J. B. Moore, J. G. Barker, and W. C. Strong, the amendment was withdrawn, and Mr. Strong's motion was unanimously passed.

It was then voted to take up the question of confirming the award of Prospective Prizes, by the Committee on Flowers.

It was moved by James Cruickshanks, and seconded by J. B. Moore, that these awards be confirmed. The subject was discussed by Messrs. Strong, Barker, C. M. Hovey, and N. B. White, and the motion was carried.

John G. Barker, Chairman of the Committee on Plants and Flowers, read the Annual Report of that Committee.

Edward S. Rand, Jr., Chairman of the Committee on the Library, read the Annual Report of that Committee.

These reports were severally accepted and referred to the Committee on Publication.

C. M. Hovey, Chairman, *pro tem.*, of the Special Committee on the exhibition of Massachusetts Fruits at the Centennial Exposition, presented the Report of that Committee, which was read by the Secretary. Permission was granted to the Committee to add to the Report the list of awards to contributors from Massachusetts by the Centennial Commission, when it should be received, and the report was accepted and referred to the Committee on Publication.

The Report of the Committee on Publication and Discussion was, at the request of the Chairman of that Committee, presented by the Secretary, who also stated that his own report was ready. The reading of these reports was deferred until the next meeting.

The meeting was then dissolved.

REPORTS.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1876.

BY JOHN G. BARKER, CHAIRMAN.

We present our report of the exhibitions with a feeling of satisfaction that this department has been so well sustained. Those who in past seasons have been regarded as regular contributors, have continued to perform their part faithfully and well. The impromptu exhibitions have been very interesting, and many objects of special merit have been shown during the early months of the year. We regret to report that the opening of the premiums to all has not resulted in the increased competition that was anticipated, and it is also with much regret that we have to report that the special prizes offered for Pelargoniums have been withdrawn, for the reason that there was but little or no competition for them. The liberal premiums offered by the Society will be continued as heretofore, and we hope that another year may witness increased competition by the cultivators of this beautiful and useful plant.

The Rose Exhibition was a decided success; at no time has there been so fine a display of the Queen of Flowers, as at the last exhibition. The manner of showing the roses in boxes, instead of bottles as heretofore, gave much satisfaction, the flowers showing to greater advantage. We are glad to know that there is much enthusiasm among the rose growers, and we have no doubt that the coming season will witness a superior exhibition in every respect.

The weekly exhibitions have been well attended and interesting, and there has been a good competition for the various prizes offered from week to week.

The Annual Exhibition was also a very gratifying success; although there were not as many large plants as there have been at some of the exhibitions, they were unusually good, and it is not too much to say, that there was not a poor plant in the hall; any one selected from any of the collections would have made a good specimen plant. It was very gratifying to see the plants so well furnished with good foliage, and void of long legs and injured foliage. Who would not prefer a small, handsome specimen, to one that must be measured by the yard to get at its size?

We were also glad to get back to our own hall again, and, although some doubted very much the wisdom of the change of the place for the plants, from so large a room as Music Hall to our own Lower Hall, it seemed to give general satisfaction, particularly as it saved the labor of carrying them up another long flight of stairs, which was found a heavy task when the flower show was held in the Upper Hall.

Cyclamens.—The exhibitors were C. B. Gardiner and James O'Brien, but, although good plants were shown, they were not equal to those of the two previous seasons. It is hoped that so beautiful a flower as the cyclamen may receive more attention from our cultivators, it being not only very useful to the florist, on account of its free flowering properties, but very valuable as a decorative plant.

Camellias were not shown in as large quantities as last season, but on the 11th of March, that being prize day, very fine collections were shown by C. M. Atkinson, of well known standard varieties, and by Hovey & Co., who, besides well known varieties, exhibited, also, the fine seedlings which have been described in previous reports.

November 11th, Marshall P. Wilder exhibited a seedling camellia in bloom, only two years and eight months from the germination of the seed. This was shown as a proof of the correctness of the belief expressed by Mr. Wilder, at one of our meetings for discussion, about two years ago, that seedling camellias and azaleas might, by grafting on older stocks, be caused to bloom in much less time than has generally been thought necessary.

Orchids have, as in past seasons, formed a very interesting and attractive feature of the exhibitions; particularly noticeable were the following named fine specimens from E. S. Rand, Jr.:

Cattleya amethystoglossa.—A magnificent species, blooming freely

from January to March. The flowers are blush, spotted with rich purple; lip rich rosy violet. For rich color of lip, this plant has no equal. This was the first time it had been exhibited.

Cattleya pumila.—A species of small growth. The plant shown was grown on a block of wood, and was about four inches high, with three flowers of a beautiful rose color, the lip being crisped, and in color crimson, edged with white.

Cirrhopetalum Medusæ.—Of this singular plant Williams says: "Amongst the strange and varied forms which the flowers of orchids present, this is certainly one of the most remarkable. The flowers, though not large, are very numerous, and part of the sepals are very much lengthened, so that the spike looks like a head with long hair hanging down, from which its name has been derived. It is a dwarf growing plant, with thick, fleshy leaves, and should find a place in every collection for its unique appearance." This was the first time it had been exhibited.

Cœlogyne cristata.—A nice plant, which was a fountain of snowy white blossoms.

Cypripedium Harrisianum.—A fine cross between *Cypripedium villosum* and *C. barbatum*, combining all the good qualities of both species. Flowers large, shining, dark purple, brown, green and yellow; foliage long, mottled. This is a very free growing plant, and will make a superb specimen. It blooms freely from November to March. We consider it one of the best of the family.

Cypripedium insigne.—Although an old species, this is one of the best. The plant shown was in very fine condition, with thirty flowers.

Dendrobium Jenkinsii.—A fine dwarf evergreen species, about two inches high. Flowers very large for the size of the plant; pale buff, edged with yellow. It blooms in midwinter and will grow on a block of wood suspended from the roof.

Lœlia anceps.—A very handsome orchid from Mexico. Perianth lilac rose; lip rich velvety purple outside, marked with crimson and veined with yellow inside.

Lœlia peduncularis.—Flowers delicate rosy purple, with a deep purple spot on the centre of the lip. A very neat growing, free flowering species.

Odontoglossum pulchellum.—Exhibited for the first time. A very handsome plant with five spikes of pure white flowers, having the crest of the lip crimson. The flowers are very fragrant and the plant is of neat habit, and is one of the best cool house orchids.

Phalænopsis Schilleriana.—Leaves very large, dark green, mottled with gray or white. Flower stems from one to three feet long, much branched, and covered with multitudes of lovely flowers from two to three inches in diameter, of delicate shades of mauve, edged with white, yellow toward the base, with reddish crimson spots. It is one of the most beautiful of all the orchids, and the specimen shown was the first exhibited here.

Saccolabium giganteum.—A very beautiful species with luxuriant foliage, producing long racemes of thickly set flowers. Sepals and petals white, the latter spotted with lilac; lip lilac and violet. The flowers are very sweet and continue in bloom a long time.

March 11th being prize day for Winter Blooming Orchids, Mr. Rand exhibited *Dendrochilum glumaceum*, *Lycaste Skinneri*, *Cypripedium villosum*, and *Dendrobium nobile*, which were described in our last report. Also the two following, both exhibited or the first time.

Lælia flava.—A very pretty plant, bearing in March a profusion of bright canary-colored flowers. A desirable species, growing freely and always giving good bloom.

Lycaste cruenta.—Perianth apple-green; lip yellow, with dark spot. Flowers very freely in March and April, and is a desirable species.

Mr. Rand has also exhibited at various times the following.—

Aerides Fieldingii.—One of the finest orchids in cultivation, commonly known as the Foxbrush Aerides. The plant grows three or four feet high, and produces, in great profusion, long branching spikes of white rosy-spotted flowers, often clear bright rose.

Saccolabium retusum.—A stout growing species, producing in early spring long spikes of white flowers, spotted with delicate rose.

Zygopetalum rostratum.—Perianth yellowish green; lip white, varied with rose.

Chysis bractescens.—Flowers large, white, with a blotch of yellow on the lip; very fragrant. A beautiful and free growing species.

Saccolabium curvifolium.—Very rare and shown for the first time. Flowers bright vermilion, very rich. It is a charming little plant.

Vanda cœrulescens.—A little gem of a plant. Foliage narrow; flowers on a very long spike, lilac blue, with rich deep blue lip. The individual flowers are small, but the spike is many flowered, and the colors are very attractive. A very nice plant with two spikes of flowers was shown.

Phalænopsis Luddemanniana.—A plant resembling *P. rosea*, but with lighter foliage. Racemes about twelve inches long; flowers two inches across, blush, barred throughout with amber and amethyst, varying to a bright rose color. The plant exhibited was a small one with two flowers, grown in a basket. It had never been exhibited here before.

Cypripedium niveum. New.

July 22d being prize day for Summer Orchids, Mr. Rand exhibited the six following named varieties.

Vanda suavis.—Perianth white outside, tinted with rosy carmine; lip lilac, tipped with white; flowers very fragrant. The plant shown was a very beautiful specimen, and the species had never been exhibited here before.

Oncidium flexuosum.

Dendrobium calceolare.

Cattleya guttata Leopoldii.

Miltonia spectabilis.

Epidendrum ciliare.

Also, *Dendrobium Devonianum.*—This species blooms along the stem, which is often several feet long. The flowers measure two inches across; the ground color is white, the sepals tipped with violet rose; petals larger than the sepals, pink, with a vivid violet spot at their base; lip beautifully fringed, white, with two bright yellow spots at the base, and a rich violet spot at the tip. This is one of the best of the *Dendrobiums.*

Oncidium Limminghei.—A minute species resembling a *Sophronitis;* flowers large, bright golden, with crimson spotted lip. A little gem of a plant.

We desire to call particular attention to a fine new *Cattleya* exhibited by Mr. Rand, February 12th. The plant was received from Messrs. Hugh Low & Son, of Clapton nurseries, London, who sent it to Mr. Rand to fill an order for six plants of *Cattleya Trianæ*, writing that they preferred to send one very fine plant rather than six small ones. It had just been received by Messrs. Low from South America and had not bloomed in England. In habit the plant appears to be a very strong growing *C. Trianæ;* the leaves are very long, thick, and very dark green; the flowers (two to four on a spike) very large, opening flat, five to six inches in diameter, sepals blush white, petals pinkish amethyst; lip very large, yellow at base, shading to deep mauve at the tip; beautifully frilled. The

flowers are exquisitely fragrant, and remain six weeks in perfection. The plant exhibited was two feet in diameter and bore sixteen expanded flowers. It is doubtless a natural seedling hybridized by insect agency from *C. Trianæ*, and has been named *Cattleya Trianæ Daisy*. Mr. Rand also showed flowers of the type *C. Trianæ* from a plant which came from Prof. Reichenbach, the greatest living orchidologist.

F. L. Ames exhibited the following new and rare species.

Cypripedium longifolium.—This is not a showy species, but it is a desirable one, as it is said never to be out of flower. The flowers are greenish white and brown, many on a spike; foliage long, dark green.

Cypripedium Dominianum.—A cross between *C. caricinum* and *C. caudatum*. Spike three flowered; petals yellowish green, very long; lip purple, green, and yellow.

Dendrobium M'Carthiæ.—A very beautiful plant, producing bright cherry red flowers, which last long in perfection; lip white and purple. It is a free grower and produces abundance of flowers.

James Comley has also exhibited *Cymbidium aloifolium*, a very pretty orchid from the East Indies, and *Aerides odoratum*, a very interesting orchid from India.

Indian Azaleas.—The exhibition of Azaleas occurred on the 8th of April. The exhibitors were Marshall P. Wilder, J. B. Moore and Hovey & Co., each of whom exhibited good collections of plants. Although there have not been as many good specimen plants exhibited as there were the preceding season, there were many fine plants shown, most noticeable among them being the following varieties from Marshall P. Wilder, the descriptions of which may be found in some of the leading catalogues.

Alba illustrata plena.	M'lle Louise de Kerchove.
Baron de Vrière.	Marie Le Febvre.
Bernhard Andrea.	Neptune.
Bernhard Andrea alba.	President Claeys.
Countess of Beaufort.	Punctulata variegata.
Eugénie de Kerchove.	Rachel von Varnhagen.
Juliette.	Roi de Belgique.
La Victoire.	Sigismond Rucker.
Madame Mendel.	Souvenir de Maximilien.

The varieties from James Comley were mostly the same as those

shown by him last season, which were fully mentioned in our last report; the plants were small, but the varieties were showy and distinct.

Hovey & Co. have exhibited from their extensive collection, besides other varieties, plants of

Bijou de Paris.	Mad. Vandercruyssen.
Constant van Keirsbilck.	Monstrosa.
Flag of Truce.	Souvenir de Maximilien.
La Victoire.	William Tell.
Mad. Marie Van Houtte.	

No better plants have ever been exhibited than those from J. B. Moore; the varieties shown were Stella, a very fine specimen, three feet high and very handsomely proportioned, also, Étoile de Flandre, Mad. Marie Lefebvre, Marie Vervaene, Todmanii, Juliana, and La Déesse.

February 12th, John F. Rogers exhibited a specimen plant of Criterion, a well-known variety; this plant was four feet high, four in diameter and ten in circumference, and was in very fine condition. June 10th, another splendid specimen was shown by C. M. Atkinson, the variety being Decora. The plant was six feet high, four in diameter, and twelve in circumference, and was one of the best specimens ever exhibited. The contrast of the richly colored flowers with the healthy foliage rendered it an object of great beauty.

Hovey & Co. exhibited a seedling azalea, of which the Committee have made the following description from notes furnished by C. M. Hovey. It is a hybrid raised a few years since between *Azalea amœna* and *A. Indica*, the object being to produce a variety as dense and dwarf in growth as *amœna*, and flowering as freely and as early, but with flowers of a brighter or lighter color. This object has been partly accomplished, the habit of the seedling being even more dense and dwarf than that of *amœna*, and it is also a more profuse bloomer, while the flowers are somewhat larger, and single like those of *A. Indica*, with a larger tube, which gives them a free and loose appearance, unlike the stiff set blooms of the female parent. The color is a clear pale rose, or rosy lilac, and the plant when in full bloom is literally covered with flowers.

It is hardly possible, in a brief space, to do justice to a plant so useful and ornamental as the azalea Nothing can be grander than the

superb specimens which have been shown at our exhibitions from year to year, presenting the greatest variety of color, from crimson to the purest white. Nor is it for exhibition purposes alone that it is chiefly valuable; for the amateur, who does not grow plants for exhibition, but wishes to keep his greenhouse or conservatory bright with flowers through winter and spring, nothing answers the purpose so well as the azalea. With a little careful management, by either forcing or retarding, it may be had in bloom from January to June. May we not hope that the many florists and amateurs who are making a specialty of the azalea may be induced to contribute even more liberally in the future than in the past to our exhibitions?

Cinerarias.—The only exhibitor was C. M. Atkinson, who brought six well grown specimen plants. It is surprising that such beautiful and showy plants, which present a great variety of color, and so well repay the grower for the time and trouble taken to produce them, should receive so little attention.

Polyanthus.—No better plants have ever been shown than the six from C. M. Atkinson. The polyanthus is one of our best spring flowering plants, and should be in every collection.

Pansies—Six well grown pots were shown by C. M. Atkinson, May 6th; also dishes of Odier and French pansies by D. Zirngiebel, and several dishes by various other contributors.

Amaryllis.—The premiums offered have so far failed to draw any competition, but at different times during the early part of the season some very fine plants, as well as cut flowers, were shown. Francis Putnam, who is quite an enthusiast over this beautiful plant, has exhibited a very good lot of seedlings, mostly varieties of *vittata*. While all were worthy of cultivation very few were distinct from the many named varieties we already have. One exception we must mention—a very fine seedling, exhibited by Mr. Putnam on the 19th of February; the flower was very large, color cherry scarlet, veined with white, each petal having a broad white stripe through the centre. It was awarded a First Class Certificate of Merit. Mr. Putnam also exhibited Amaryllis Bayard, Phœbus, Mrs. Kimball, and Johnsonii.

From J. B. Moore we have had well grown plants of Artemesia, Cleopatra, Regina, Aurora, Bayard, and Halfordii.

Pelargoniums.—The special prize day was May 13th, and the exhibition was one of the best ever made. Although the plants were hardly equal to those shown last season, they still made a very

brilliant display. The exhibitors were Wm. Gray Jr., Hovey & Co., and James Comley. We omit the lists of names as the varieties were very much the same as those shown last year, of which full lists were given.

At the Rose Exhibition, June 21st, H. H. Hunnewell exhibited six very fine Variegated Zonales. The plants from Mr. Hunnewell are always first-class in every respect, and at all times a great addition to the shows.

The Pelargonium Exhibition is one of the most important now held by the Society, and for its success we are largely indebted to that enthusiastic amateur, William Gray, Jr. As the plants are so easily grown and there are many good collections in our vicinity, we trust that the future exhibitions will show increased competition over the successful ones already held.

Show and Fancy Pelargoniums.—The only plant shown was a very fine standard from C. M. Atkinson, on the 25th of March. It was five feet high, with a well formed head; the foliage was very luxuriant, and was intermixed with an abundance of bloom. The variety was Belle of Paris.

Spring Herbaceous Plants. — E. S. Rand, Jr., showed a very fine collection of sixty-five species and varieties; a list of them is appended, and will prove a valuable help to those who are about making up collections.

Anemone nemorosa.
" " *purpurea* (English).
Aquilegia Canadensis.
Asarum Canadense.
Corydalis aurea.
" *nobilis.*
Dicentra Cucullaria.
" *eximia.*
Epimedium sp.
Erythronium albidum.
" *Dens canis.*
Ficaria ranunculoides.
" " *fl. pl.*
Fragaria Virginiana.
Geum rivale.
Gnaphalium sp.
Hepatica acutiloba.
" *triloba.*
Houstonia cœrulea.
Iris pumila.
Jeffersonia diphylla.
Orobus vernus.
Pachysandra procumbens.
" " *variegata.*
Pœonia tenuifolia.
Phlox nivalis.
" *subulata*, 2 var.
Podophyllum peltatum.
Polemonium reptans.
" *Virginica.*
Potentilla sarmentosa.
Primula veris.
" *Polyanthus.*

Sanguinaria Canadensis.
Saxifraga Virginica.
Trillium erectum.
" *grandiflorum.*
" *sessile.*
Uvularia grandiflora.
" *sessilifolia.*
Viola blanda.
" *Canadensis.*
" *cucullata.*
" *odorata alba.*
" *saggitata.*
" *tricolor*, 10 var.

Calceolarias. — Six well grown plants were shown by C. M. Atkinson. Perhaps no plant in cultivation possesses so much richness and variety of color in its blossoms as the Calceolaria, and when we consider the ease with which it is cultivated, it is surprising that so few have been exhibited.

Tree Pæonies were shown by Marshall P. Wilder and Hovey & Co. The large collections grown by these gentlemen enable them always to make very fine displays.

Hardy Shrubs. — A very good collection of cut flowers was shown by Miss A. C. Kenrick, consisting of varieties of Azaleas, Hawthorns, Spiræas, Lilacs, Dutchman's Pipe, Weigelias, Calycanthus, etc. Miss S. W. Story also had a small collection.

Rhododendrons. — June 3d being the regular prize day, E. S. Rand, Jr., exhibited a very fine collection, the names of which are given below. Considerable pains have been taken to prepare these lists, and it is hoped that they may be useful to the members of the Society. (h., hardy; h. h., half hardy; p. h., probably hardy; t., tender.)

Album.—White; h.
" *elegans.*—Blush white; h.
Atrosanguineum.—Blood red; h.
Aucubæfolium.—Lilac; h.
Bicolor.—Rose with white spot; h.
Brayanum.—Rosy scarlet; t.
Candidissimum.—White; h. h.
Charles Dickens.—Dark scarlet; p. h.
Congestum roseum.—Light rose.
Coriaceum.—Pure white; h.
Cunningham's Dwarf White.—White; h. h.
Delicatissimum.—Blush white; h.
Everestianum.—Rosy lilac, fringed; h.
Giganteum.—Bright rose; h.

Glennyanum.—Blush; t.
Grandiflorum.—Rose; h.
Hannibal.—Fine rose; h.
Kettledrum.—Fine red.
Lady Armstrong.—Pale rose with dark spots; p. h.
Lady Emily Peel.—Rose with chocolate spots; t.
Lee's Dark Purple.—h.
Leopardi.—Rosy lilac, spotted; h. h.
Limbatum.—White with crimson edge; t.
Londinense.—Purple with light centre; t.
Lucidum.—Purplish lilac; t.
Marc Antony.—Lilac; p. h.
Mrs. Milner.—Crimson; very fine; p. h.
Mt. Blanc.—White; p. h.
Neige et Cerise.—White with crimson edge; t.
Onslowianum.—Waxy blush with yellow eye; t.
Perfection.—Blush with yellow eye; t.
Perspicuum.—Blush; t.
Purity.—White with yellow eye; t.
Purpureum elegans.—Fine purple; h.
" *grandiflorum.*—Purple, large truss; h.
Reedianum.—Cherry red; t.
Rosabel.—Pale rose; t.
Roseum elegans.—Rose; h.
" *grandiflorum.*—Rose; h.
" *pictum.*—Rose; h. h.
" *superbum.*—Light rose; h.
R. S. Field.—Fine scarlet; t.
Sir Isaac Newton.—Spotted purple; h. h.
Splendens.—Rose; h.
Stella.—Rose with chocolate marking; p. h.
Sultana.—White with brown spots; t.
Verschaffeltii.—Purplish blush; t.
Victoria.—Deep claret color; t.

On account of the lateness of the season, the Hunnewell Special Prizes were not awarded until June 10th. The exhibitors were E. S. Rand, Jr., and Joseph Clark. In addition to those already named, Mr. Rand exhibited very fine trusses of

Alarm.—Crimson and white; t.
Archimedes.—Rosy crimson; h. h.

Bertie Parsons (Parsons).—White and mauve; h.
Blandyanum.—Rosy crimson; h. h.
Broughtoni.—Rosy crimson; t.
Bylsianum—White and pink; very fine; t.
Caractacus.—Rich purplish crimson; h. h.
Charles Bagley.—Cherry red; t.
Columbus.—Rosy purple; h. h.
Crispiflorum (Parsons).—Purplish; h.
Cruentum.—Rich lake; t.
Decorator.—Clear rose; t.
Desdemona.—Blush; t.
Duchess of Sutherland.—Rosy lilac; t.
General Cabrera.—Crimson; t.
Guido.—Crimson; t.
H. H. Hunnewell.—Rich crimson; h. h.
H. W. Sargent.—Crimson; p. h.
James Bateman.—Rosy scarlet; t.
John Waterer.—Dark crimson; t.
Lady Clermont.—Rosy scarlet and black; t.
Lady Godiva.—White and yellow; t.
Lord Clyde.—Deep blood color; t.
Lord John Russell.—Red spotted; t.
Magnum Bonum.—Rosy lilac; p. h.
Milnei.—Rosy crimson; p. h.
Mrs. John Clutton.—White; very fine; t.
Mrs. Thomas Wain.—Pale rose; t.
Nigrescens.—Purple, almost black; h. h.
Othello.—Crimson; t.
Paxtoni.—Deep rose; h. h.
Scipio.—Rose, finely spotted; t.
Surprise.—Lilac; t.
Sidney Herbert.—Crimson with dark spots: t.
Titian.—Rosy scarlet; fine; t.

We are not able to give a list of the varieties shown by Mr. Clark, as none was handed the Committee.

H. H. Hunnewell also exhibited a superb lot of rhododendrons, but we have no list of the varieties. To Mr. Hunnewell, more than to any other person, are we indebted for the increased interest in the cultivation of the rhododendron.

On Saturday, June 17th, Mr Rand again exhibited a very fine

lot of rhododendrons, comprising, with others, many of the varieties already named.

The display of rhododendrons the present year has been remarkably fine; in size of truss, perfection of individual flowers, and profusion of bloom it has never been surpassed. It is much to be regretted that this plant, so ornamental in foliage and showy in flower, is not generally grown. The hardy varieties, once well established, require no care, and the tender are very easily grown, and only require winter protection.

The Committee have awarded to E. S. Rand, Jr., the Society's Prospective Prize, for the best Seedling Hardy Rhododendron, for the variety named Daisy Rand, which has been shown at our exhibitions for the last six years. The plant has been examined in Mr. Rand's grounds, where it has stood in a most exposed situation, wholly unprotected, for the last twelve years. The following description has been made by the Committee, from notes furnished by Mr. Rand;

The plant is of dwarf habit, but very spreading and short jointed; foliage very large, oval, bright polished green on the upper surface, and very white below. It is very floriferous, the smallest branches carrying trusses of bloom, which are large, full, and globular. The individual flowers are of great substance, and last very long in perfection, as proved by the fact that trusses from the same plant were shown this year at our exhibitions on three successive Saturdays. The flower is rosy scarlet with light centre, the upper petals being profusely spotted with chocolate. We regard this variety as a most valuable addition to our shrubs.

Hardy Azaleas.—E. S. Rand, Jr., E. Shepherd, and B. G. Smith were the exhibitors, and the same remarks that we made in regard to the rhododendron will apply equally to the azalea. The collections exhibited were unusually good, that of Mr. Rand being the largest. We again express our hope that the very liberal premiums offered by Mr. Hunnewell for rhododendrons and azaleas, will bring out a much larger competition than we have had the past season.

Roses.—As was predicted in our last report, the Rose Show was, without doubt, the best ever held by the Society; the Queen of Flowers was present in her best attire. For the Society's prizes, William Gray, Jr., James Comley, J. H. Woodford, J. B. Moore, C. M. Atkinson, Francis Parkman, and Joseph Clark were the competitors.

We append, for the benefit of those about making up a collection of roses, a list of the best twenty-four varieties shown, and we feel sure that no one will be disappointed in the selection, it being the result of years of experience of one of the most enthusiastic of amateurs, William Gray, Jr.

Alfred Colomb.—Bright, light crimson; large and full, fine form.

Baronne Prévost.—Pale rose; very large and full.

Caroline de Sansal.—Clear flesh, blush edges; large and full.

Comtesse d'Oxford.—Bright carmine red, shaded; large, full and fine form.

Dupuy-Jamain.—Very bright cerise; large, full and fine form; blooms freely.

Edouard Morren.—Glossy pink; in the way of Jules Margottin, but of a fresher and more delicate color; of better form, and much larger; very fine.

Etienne Levet.—Carmine; large; full, fine form.

Felix Genero.—Beautiful violet; large, full and globular form; one of the best.

Ferdinand de Lesseps.—Dark purple, shaded with violet; large and fine.

Fisher Holmes.—Magnificent scarlet red; imbricated, large and full; form like a camellia.

General Jacqueminot.—Brilliant scarlet crimson; large and magnificent.

John Hopper.—Rose, crimson centre; large, full and good.

Jules Margottin.—Brilliant glossy pink; flowers large, smooth and cupped; a superb rose.

La France.—Beautiful pale peach, rose centre: very large and full; free bloomer, a good bedding and decorative rose.

La Reine.—Rosy pink, tinged with lilac; very large.

Mad. Laurent.—Beautiful cherry red; full, large, and very fine.

Mad. Marius Cote.—Clear red; full; a fine open flower.

Mad. Rothschild.—Beautiful bright rose, shaded with white; very large; handsome foliage.

Mad. Victor Verdier.—Beautiful cherry rose; large and full; form exquisitely cupped.

Marquis de Castellane.—Bright clear rose; large and full; fine form.

Mrs. Laing.—Bright carmine rose; medium size; free grower.

Paul Neron.—Dark rose; extra large; fine form and habit.

Paul Verdier.—Bright rose; large, full, and finely imbricated.

Perfection de Lyon.—Bright rose, reverse of the petals lilac; form cupped, large and full.

The collections of twelve, six, and three, were all unusually good, but not distinct enough from those already named to require special mention.

Moss Roses.—President Parkman has expressed our opinion of the Moss Rose so well in his excellent "Book of Roses," that we are sure he will pardon us if we give our ideas in his words: "At the present day, when the annual progeny of new Perpetual roses from the nurseries of France, with a humble reinforcement from those of England, has eclipsed by numbers the old garden favorites, the well-remembered roses of our infancy, the Moss alone stands in tranquil defiance of this gay tide of innovation. Nothing can eclipse and nothing can rival her. She is, and ever will be, the favorite of poetry and art; and the eloquence of her opening buds, half wrapped in their mossy envelope, will remain, throughout all generations, a chosen interpreter of the language of youth and beauty."

We are glad to report that a very fine collection of Moss roses was shown by C. M. Atkinson. The following is a list:

Celina Moss.	Lanei Moss.
Common Moss.	Marie de Blois.
Crested Moss.	Mad. Albani.
Denis Helye.	Oscar Leclerc.
Glory of the Mosses.	Princess Adelaide.
James Veitch.	

Tender Roses.—The best twelve named varieties were shown by James Comley; also the best twelve Marshal Niel, which were exceedingly fine.

General Display.—The extent of this display was unusually large and fine. The names of Francis Parkman and Joseph Clark are a sufficient warrant of the character of the flowers placed upon the stands.

Hunnewell Special Prizes.—For the best six new varieties sent out since 1872, William Gray, Jr., contributed the following:

Captain Christy.—Delicate flesh color, rose colored in the centre—a very effective new color; very large.

Etienne Levet.—Carmine; large, full, fine form.

François Michelon.—Floriferous; flowers large, full; fine deep red, reverse of petals, silvery.

Mad. Marius Cote.—Clear red, full.

May Turner.

Richard Wallace.—Flowers full, very well formed; bright rose, slightly edged white.

For the best six named varieties, William Gray, Jr., exhibited Charles Lefebvre, La France, Marquise de Castellane, Mad. Rothschild, Mad. Vidot, Victor Verdier.

From C. M. Atkinson, came Duchess of Edinburgh, John Harrison, Madame Nachury, Miller Hayes, Mlle. Dumaine, Thomas Mills.

For the best twelve of any one variety, William Gray, Jr., exhibited twelve fine specimens of Baronne Prévost.

Gray Special Prizes.—For the best twelve of any one variety, J. C. Chaffin exhibited a superb stand of Victor Verdier.

For the best six of any one variety, James Comley had an equally superb stand of Baronne de Rothschild.

For twelve named varieties, Francis Parkman exhibited the following named superb varieties, which were pronounced by all, the best twelve roses ever on exhibition. The varieties were

Alfred Colomb.	La France.
Annie Wood.	Leopold Premier.
Ardoisé de Lyon.	Maréchal Vaillant.
Charles Lefebvre.	Marguerite Dombrain.
Felix Genero.	Paul Neron.
Glory of Waltham.	Perfection de Lyon.

Comley Prize, for the best Single Flower.—There were several contributors, the successful one being J. C. Chaffin, with a very fine flower of Charles Lefebvre.

The Society is to be congratulated on the success of this show, and we trust that not only the exhibitors of the past season, but other rose growers, will add their productions to the future exhibitions.

In addition to his display at the regular Rose Show, James Comley has exhibited some very fine plants, grown in pots. of Hybrid Perpetuals, viz.:

Captain Christy.

Comtesse d'Oxford.

Elie Morel.

Mad. Larcharme.—White, very large, a first rate flower, the finest of its class.

Mad. Lefebvre Bernard.—Bright rose, tipped with white; fine bloomer, very large.

Paul Neron.

Prince Paul Demidoff.—Fine clear carmine rose; very large, full, fine form.

Princess Beatrice.—Light peach color; fine form.

Rosa Bonheur.

Souvenir de Gen. Douai.

Mr. Comley has also shown the following new Tea roses:

Catherine Mermet.—Light flesh color, large; a splendid rose.

La Jonquille.—Very yellow; medium flower, and said to be a good bloomer.

Mad. Charles.—Light yellow with salmon centre; large and well formed.

Triomphe de Rennes.

Marie Accary (Noisette).

From J. B. Moore we had fine plants of Hybrid Perpetual roses Duke of Edinburgh and Mad. Lacharme. Both of these plants were in admirable condition and full of fine flowers and buds. Mr. Moore has also exhibited very fine collections of cut flowers of choice Hybrid Perpetual roses, which for size of flower and fine form have seldom, if ever, been equalled. He has also shown the new Tea rose, Cheshunt Hybrid, the color of which, cherry carmine, is quite novel. It is a very fine rose.

W. H. Spooner and B. G. Smith, have each shown good collections of Hybrid Perpetual roses; L. H. Foster and Twombley & Sons, Bon Silene and Saffrano rose buds, and E. S. Rand, Jr., very fine dishes of Cherokee and Fortune's Double Banksia roses.

Gloxinias.—We regret to report that for the prizes offered there was no competition, except for the single specimen, Joseph Clark being the successful competitor with a fine plant.

J. B. Moore has shown some very good seedlings, making on the 29th of April a good display under numbers. The Committee considered the following as worthy of note: No. 2; medium sized flower, spotted throat, crimson lake, edge of petals faint lilac. No. 3; large flower, color crimson with deeper velvety crimson tube, white spotted throat. No. 5; large flower; color deep purple, with light violet edges, white throat. On the 15th of April Mr. Moore presented another fine seedling, a good flower, of fine substance, large, round, well opened; white throat shading to a purplish crimson, with delicate pink edges.

From James Comley we had three new varieties, Rev. H. Dombrain, Julie, and Caroline.

Wardian Cases.—W. H. Halliday, Hovey & Co., A. Greenlaw, and Carl Deeterich were the exhibitors. Mr. Halliday's cases are so well known that no comment on them is necessary; suffice it to say they were fine specimens of neatness and good taste. If there is any criticism at all to be made upon the others it is that the cases were so elaborate as to distract attention from the plants growing in them; but they were very handsome parlor ornaments.

Fern Cases were shown by W. H. Halliday, very neatly arranged with choice ferns and lycopods.

Sweet Williams.—There were several collections shown, but the best were from Joseph Clark and James Nugent, each having a good stand of fine distinct varieties, Hunt's Auricula Flowered largely predominating.

Summer Herbaceous Plants.—Francis Parkman and James McTear were the exhibitors. The stand from Mr. Parkman was an unusually good one, and contained a very choice collection of named varieties; the stand from Mr. McTear was also a very good one.

Delphiniums.—Francis Parkman showed a very fine collection, comprising some magnificent spikes of extremely rich and showy flowers. No one has done as much as Mr. Parkman to improve this valuable plant, and we are glad that his efforts are being rewarded by the production of such beautiful flowers as were shown on this occasion.

Late Phloxes.—A very fine display was made by several contributors; the best collections were from Francis Parkman and Hovey & Co., and were undoubtedly the best ever exhibited. Great improvement has been made in this valuable herbaceous plant, which for late summer flowers has no equal.

For the best Seedling Late Phlox, the Silver Medal was awarded to Francis Parkman, for a very fine flower marked No. 2; color bright rose, with brilliant scarlet eye; large and full. Mr. Parkman has also shown a very fine lot of seedlings in addition to the one just mentioned; particularly good were those marked F,—white with deep crimson eye, heavily flamed with the same color. J,—bright rose with scarlet eye; and D,—white, with dark rose eye. James Comley has also shown a very good lot of seedlings.

Petunias.—The best stands were those from E. W. Wood and

James Cartwright; there were other contributors. and the display this season was unusually good.

NATIVE FERNS.—An excellent collection was shown by Mrs. Horner, numbering some fifty species and varieties, all neatly and correctly named, which added very much to the interest of the collection. On the 27th of June, John Robinson exhibited thirty-three species and varieties of hardy North American Ferns; we append the list with the notes as given by Mr. Robinson, which we are sure will be of great interest to all. He says—

"These ferns have been grown in my garden for the number of years indicated by the figures placed against the names, without special care, and without any other protection during winter than a few leaves. Those marked with a star are ferns not yet fairly tested in my garden, though perfectly hardy in certain other localities.

Polypodium vulgare. 10.
Phegopteris Dryopteris. 10.
" *polypodioides.* 10.
Struthiopteris Germanica. 5.
Pteris aquilina. 4.
Adiantum pedatum. 9.
Woodwardia angustifolia. 5.
**Camptosorus rhizophyllus.* 2.
**Asplenium Ruta-muraria.* 1.
" *Trichomanes.* 5.
" *ebeneum.* 5.
" **angustifolium.* 2.
" *thelypteroides.* 5.
" *Filix-fœmina.* 10.
Dicksonia punctilobula. 5.
* *Woodsia obtusa.* 3.
Cystopteris fragilis. 10.
Cystopteris bulbifera. 5.
Aspidium Noveboracense. 5.
" *spinulosum intermedium.* 10.
" " *Boottii.* 5.
" " *dilatatum.* 10.
" *cristatum.* 5.
" " *Clintonianum.* 2.
" *Goldianum.* 2.
" *marginale.* 10.
" " *elegans.* 10.
" *acrostichoides.* 10.
Onoclea sensibilis. 10.
Osmunda cinnamomea. 10.
" *Claytoniana.* 5.
" *regalis.* 10.
" " var. 10."

On the 15th of July, George E. Davenport exhibited a very fine collection of Native Ferns, a list of which, with notes, he has prepared at our request.

"*Polypodium vulgare*, L.—A hardy evergreen species; common.
" *incanum*, Swz.—From Texas.
Gymnogramme triangularis. Klf.—From California.

Pellæa gracilis, Hook.—From Vermont; hardy.
" *atropurpurea*, Link.—From Syracuse, N. Y.; hardy.
" *ornithopus*, Hook.—From Yuba Co., California.
" *brachyptera*, Baker.—From Sierras, California.
Pteris aquilina, L.—Common brake: hardy.
" *aquilina*, var. *lanuginosa*. Hook.—From Oregon. (Exhibited for the first time.)
Lomaria Spicant, Desv.—From Oregon; hardy; evergreen.
Woodwardia Virginica, Smith.—Mass.; hardy.
" *angustifolia*, Smith.—Mass; not common; hardy.
Scolopendrium vulgare, Smith.—From Owen Sound, Canada; hardy; evergreen.
Camptosorus rhizophyllus, Link.—From Vermont; hardy: evergreen.
Asplenium Trichomanes, L.—Mass.; hardy; evergreen.
" *ebeneum*, Aiton. " " "
" *thelypteroides*, M.—Not common; hardy.
" *Filix-fœmina*, Bernh.—Mass.; common; hardy.
Phegopteris polypodioides, Fée.—Essex Co., Mass.; hardy.
" *hexagonoptera*, Fée—Medford, Mass.; not common; hardy.
" *Dryopteris*, Fée—Berkshire Co., Mass.; not common; hardy.
Aspidium acrostichoides, Swz.—Mass.; hardy; evergreen.
" *aculeatum*, var. *Braunii*, Döll.—Vermont; hardy.
" *Thelypteris*, Swz.—Mass.; common; hardy.
" *Noveboracense*, Swz.—Mass. " "
" *patens*, Swz.—From Texas.
" *fragrans*, Swz.—From Vermont.
" *spinulosum*, Swz.—Newton, Mass.; hardy.
" " var. *intermedium*. " "
" " " *dilatatum*, Gray.—Mass.; hardy.
" " " *Boottii*, " " "
" *cristatum*, Swz.—Mass.; hardy.
" " var. *Clintonianum*.—Berkshire Co., Mass.; hardy.
" *Goldianum*, Hook.—From Vermont; hardy.
" *Filix-mas*, Swz.—From Owen Sound, Canada; hardy.
" *marginale*, Swz.—Mass.; hardy; evergreen.
Struthiopteris Germanica. Willd.—Mass.; hardy; not common.

Onoclea sensibilis, L.—Mass.; hardy.
Cystopteris fragilis, Bernh.—Mass.; hardy.
" *bulbifera*, Bernh.—Syracuse, N. Y.; hardy.
Woodsia Ilvensis, R. Br.—Mass.; hardy.
" *obtusa* Low.—Mass.; hardy.
Dicksonia punctilobula, Kze.—Mass.; hardy.
Osmunda regalis, L.—Mass.; hardy.
" *Claytoniana*, L.—Mass.; hardy.
" *cinnamomea*, L. " "
Botrychium ternatum, Swz.—From California; hardy.
" *Virginicum*, Swz.—Mass.; hardy.
Adiantum pedatum, L.—Mass.; hardy.
" *Capillus-Veneris*, L.—From Utah.

This exhibit was the result of my first season's cultivation of ferns, the specimens having been all grown in my garden, under the disadvantage of an unusually dry summer. Though by no means so large or fine as I hope to show another season, they have strengthened my convictions that our native ferns may be readily cultivated and become permanent objects of beauty in our gardens."

Gladioli, as in seasons past, have been a very prominent feature of the exhibitions. J. S. Richards and George Craft have contributed most frequently, and W. H. Spooner has sent some fine English and French varieties. The prize day was August 19th, when J. S. Richards, J. B. Moore, George Craft, A. McLaren, and Herbert Gleason, exhibited very fine stands of flowers. At the annual exhibition, George Craft and A. McLaren exhibited fine stands of almost every shade and color, and J. S. Richards a stand of his fine seedlings.

Asters.—Unusually good collections were shown by C. M. Atkinson, J. B. Moore, J. A. Black, James Nugent and Hovey & Co. The competition was unusually active, and the flowers, both as to size and variety, were the best we have seen.

Lilies.—September 2, being prize day, W. H. Spooner, made a very fine display of *Lilium lancifolium*, *L. macranthum*, *L. punctatum*, *L. album*, *L. rubrum*, and *L. monstrosum*. From Hovey & Co. came lilies Melpomene, Thalia, and Clio. From C. M. Atkinson, three very fine pots of *Lilium longiflorum*. From C. A. Putnam, *L. Washingtonianum*. From B. K. Bliss, *L. avenaceum*, *L. cordifolium*, *L. Krameri*, and *L. Hansonii*. From N. Hallock, *L. Leichtlinii* and *L. tigrinum fl. pl.* From Francis Putnam. *L. au-*

ratum, and from James Comley, a very fine stand of *L. Canadense*.

The Committee have awarded the Prospective Prize to Francis Parkman for his Seedling Lily, to which the name of *Lilium Parkmanni*, has been given in England. It first bloomed in 1869, and has been shown nearly every year since. Last year it was exhibited on the 5th of August. In England it has been pronounced the best lily ever raised. Four, if not more, engravings of it have been printed, and it has excited a discussion in the journals and magazines which still continues. No flower raised in this country has ever created such a sensation abroad. We copy the following account, by the originator, from the "Gardener's Chronicle:"

"It is a hybrid between *Lilium auratum*, and a deep colored variety of *L. speciosum*. The latter was the female parent. Impregnation took place readily, and the young bulbs were planted in the open ground for the first time in the spring of 1869. There were about fifty of them. Several, as they grew, showed the peculiar spotted stem of the male parent, but when they set flower buds, as nearly all of them did in the same season, the features of *L. auratum* could be distinguished in only one of them. The rest, in bud and flower, appeared to be merely *L. speciosum*, quite unaffected by the pollen of the male parent.

The one case alluded to was a remarkable exception. The flower opened ten days earlier than any of the rest; its color was a deep red; it had the fragrance of *L. auratum* and resembled it also in form. This first flower measured nine and a half inches from tip to tip of the petals. In the following year there were several flowers, of which the largest measured eleven and a half inches. The bulb was then in a pot; as no special pains or skill was applied to its cultivation, the flower might doubtless be grown to the diameter of a foot.

This hybrid was the result of a great number of experiments in the cross fertilization of lilies."

Messrs. Hovey & Co. have also raised a new hybrid lily, which they have offered for the Society's Prospective Prize. The following description of it is by C. M. Hovey:

"*Lilium speciosum Hoveyi*, is a seedling from *L. Melpomene*, fertilized with *L. auratum*. It was the first hybrid raised between these two varieties, immediately after the latter was first exhibited. It bloomed magnificently, and the plant, with twelve fully expanded flowers was exhibited before the Society in 1866, but owing to an

unfortunate accident, the bulb was nearly lost, and has not bloomed until recently, and has not again been exhibited until this year, when flowers from young bulbs were shown in July.

It is a fine acquisition, and in its whole character shows the influence of each parent, and the valuable results to be obtained by hybridization. The flowers are very nearly of the form of *L. speciosum*, and the colors similar, only more clear, better defined, and deeper, as well as more brilliant. The foliage is also the same. In the size of the flowers, however, it takes after *L. auratum*, even excelling that large flower, being nearly or quite fourteen inches in diameter in full sized blossoms, the bud measuring exactly seven inches long just before opening; the petals are three inches in breadth. It also flowers about the same season, or a week or two earlier than *L. speciosum*.

Its remarkable qualities, aside from the size of its immense blossoms, are the clearness of its pure white petals, without any intermixture of green, and the deep, rich, brilliant color of the broad carmine band which runs through the centre of each, intensified by conspicuous large, bold, crimson spots, and still darker blood-colored papillæ, with which they are thickly studded at the base. The petals are also flat (not twisted), and reflex with an evenness and beauty rarely seen among the reflexed lilies. It is a remarkably robust grower, attaining the height of from six to seven feet, with a stem an inch in diameter. The plant produces from twelve to twenty flowers."

Verbenas.—The show was unusually large, there being seven contributors, and the varieties were much better than usual. E. C. Smith and J. O'Brien were the successful competitors.

Native Plants have been shown by Mrs. C. N. S. Horner, E. H. Hitchings, and G. E. Davenport. This department is always very interesting and the contributors have been indefatigable in their labors to do their part well, Mrs. Horner's displays having been the largest. The plants have been neatly and correctly named, which made them a very interesting feature of the exhibitions. We notice as worthy of mention from Mr. Davenport, —

Arabis sp.
Cassandra calyculata.
Castilleia coccinea (Painted Cup).
Claytonia Virginica (Spring Beauty). From Illinois.
Collinsia verna.

Dicentra Cucullaria (Dutchman's Breeches).

Eriostemon angustifolium.

Hepatica triloba, a plant in a pot, showing the flowers transformed into leaves.

Hottonia inflata (Water Violet), a very fine specimen.

Hydrophyllum appendiculatum. From Illinois.

" *macrophyllum.* " "

Mertensia Virginica (Virginian Cowslip or Lungwort).

Pyxidanthera barbulata. From the pine woods of New Jersey.

Trillium erectum (Purple Trillium, Birthroot).

" *grandiflorum* (Large White Trillium).

" *nivale* (Dwarf White Trillium).

" *sessile.*

Uvularia grandiflora (Large Flowered Bellwort).

Viola rotundifolia.

Zanthoriza apiifolia (Shrub Yellow-root), from Concord, Mass.

July 22d, E. H. Hitchings exhibited a very interesting specimen of the *Nymphæa odorata* (Water Lily), showing the roots, leaves, and flowers, both in the undeveloped and perfect state. Also, *Utricularia gibba* (rare), *Eriocaulon septangulare*, *Epidendrum conopseum*, from Florida; *Habenaria blephariglottis*, *H. psychodes*, *Cuscuta Gronovii*, and other choice varieties.

Double Zinnias.—September 9th being prize day, very fine stands were shown by George Craft, James Nugent, and others. It is gratifying to see this useful annual coming into general cultivation. With its numerous varieties, of almost every shade of color and lasting so long in perfection, no garden can well afford to be without it.

Cut Flowers.—For the prizes for fifty named varieties of greenhouse flowers, Hovey & Co., C. M. Atkinson, and James McTear, have been the competitors; of the fifty named Annuals and Perennials, Hovey & Co. have been the only contributors. We must repeat what we stated in our last report—that the competition for these prizes has not met the expectations of the Committee. It was hoped that the premiums offered for named varieties of flowers would incite a spirited competition, and that the collections offered would form a very instructive feature of the exhibitions, but so far they have been a failure.

Cut Flowers (150 bottles). W. K. Wood and James Comley, have contributed regularly to the weekly exhibitions, very handsome

stands of choice flowers. Hovey & Co. and Mrs. E. M. Gill have been the next largest contributors, and J. B. Moore and J. O'Brien have sent occasional contributions. Owing to the dryness of the season, the competition was probably less than it otherwise would have been, but those who have contributed have done their part well, and, as in all past seasons, have added very much to the appearance of the Hall. At the Annual Exhibition, the display was unusually good, and the stands were kept up with choice flowers through the exhibition very much better than usual. The contributors were W. K. Wood, Hovey & Co., Mrs. E. M. Gill, W. C. Strong, J. O'Brien, James Nugent, and A. H. Dunlap.

Greenhouse Plants.—April 8th, C. M. Atkinson, and E. S. Rand, Jr. each exhibited six well grown plants in fine healthy condition.

June 28th, H. H. Hunnewell exhibited six fine greenhouse Flowering plants, viz.: *Azalea decora*, *A. Gledstanesii*, *Rhynchospermum jasminoides*, *Fuchsia Avalanche*, *Anthurium Scherzerianum* and *Trichinium Manglesii*. These were all well grown handsome specimens.

E. S. Rand, Jr., exhibited *Allamanda Schottii*, *Cattleya Mossiæ*, *Dendrobium albo sanguineum*, *Saccolabium retusum*, *Vinca rosea*, and *V. alba*.

At the Annual Exhibition, F. L. Ames, Hovey & Co., and William Gray, Jr., exhibited very fine collections of plants. At no time has the Hall been graced with a collection superior to that of F. L. Ames; every plant was a clean, handsome specimen. The species were as follows, —

Kentia Forsteriana, a new species of palm, introduced by M. Linden, from Lord Howe Island, which lies between New South Wales and New Zealand.

Areca rubra, a very graceful species, having light and feathery foliage; dark green color. It is suitable for table decorations, and is one of the best for general stove purposes.

Areca lutescens, a fine palm for table decoration, being small and dwarf; fronds graceful; pale green. This species ought to be in every collection.

Cocos Weddelliana, the most elegant species of this genus, with gracefully spreading fronds. When not more than four feet high, young plants of it have often as many as twelve and twenty fronds, forming a plume of the most beautiful description.

Geonoma Schottiana.—Fronds from two to four feet long, drooping, slender. A truly elegant palm, of light feathery appearance, not to be surpassed for decorative purposes.

Dracœna amabilis.

Pandanus Veitchii.

Beaucarnea recurvata.—A native of Mexico; trunk reaching a height of five to six feet, two to three inches thick; leaves, one hundred or more in a very dense rosette, recurved from the very base, three to five feet long, three-fourths of an inch to an inch broad above the deltoid base.

Croton maximum.—The largest of the yellow leaved varieties; of strong robust habit; leaves of a rich golden color, marked on each side of the midrib with dark olive green bands of irregular form.

Sphœrogyne latifolia.

Curculigo recurvata variegata.

Hovey & Co. exhibited the following:

Areca speciosa.

Chamœrops excelsa.

Pritchardia Pacifica, with magnificent, large, fan like leaves.

Seaforthia robusta.

Phormium atropurpureum, a very distinct kind, of the habit of *P. tenax*, but with leaves of a beautiful reddish purple.

Phormium Veitchii var.—A highly ornamental and noble plant for the garden or conservatory.

Croton irregulare.—Very handsome, having long narrow leaves, which are dark green, with a light red midrib; highly decorative.

Dracœna Youngii, a bold, robust, spreading kind; very fine.

Pandanus ornatus, with superb, long, green leaves.

Yucca quadricolor, with fine, narrow, drooping foliage: green ground, striped with yellow and crimson.

Paullinia thalictrifolia, a lovely, half climbing plant, of slender growth, producing very freely its beautifully cut leaves, which resemble the fronds of a Maiden Hair fern.

Hovey & Co. have for many years been contributors to the exhibitions, but at no time have they shown a collection better than that just named.

Specimen Plants.—June 22d, H. H. Hunnewell exhibited a splendid plant of *Pandanus Veitchii*, one of the most beautiful plants introduced by the Messrs. Veitch; the leaves are light green,

beautifully striped with broad bands and lines of pure white, and are gracefully recurved. It is a superior plant for exhibition or decorative purposes.

At the Annual Exhibition Hovey & Co. exhibited a splendid specimen of *Pandanus reflexus*, a fine stove evergreen plant. William Gray, Jr., showed a very fine specimen of *Platycerium grande*. "This fine fern should be grown on a large block, upon which it forms a beautiful coronet. The sterile fronds or shields are erect and permanent, alternately overlapping each other, rounded on the lower edge, the upper part much divided or forked. The fertile fronds rise from the sinus of the sterile ones, are coriaceous in texture, many times dichotomously forked, and densely clothed with white, stellate scales; they measure from one to three feet in length, and the sori form a dense, irregular patch near the sinus of the first division. It requires a stove temperature. It is a native of the Malay Islands, and of various parts of Australia." "The Garden," Vol. III, p. 275, where it is also figured.

Specimen Flowering Plants.—Hovey & Co. exhibited *Lapageria alba*, and *Allamanda Schottii*, and William Gray, Jr., *Cypri pedium Roezlii*. The last named is a native of New Grenada; the sepals of the flower are of a delicate pink color, streaked with red, the greenish, attenuated petals being margined with bright pink or red; the lip is of a clear greenish yellow tint; the leaves are glossy bright green. We believe it is the first time it has been exhibited.

Variegated Leaved Plants were shown by Hovey & Co. and William Gray, Jr., and although there was nothing new in either collection, the plants were well grown specimens of good standard species and varieties.

Specimen Variegated Leaved Plants.—William Gray, Jr., exhibited a fine plant of *Phormium Colensoi*, and J. B. Moore, a fine plant of *Croton interruptum*.

Caladiums were shown by C. M. Atkinson, Hovey & Co., J. B. Moore, and W. T. Andrews. The plants were not as large as some that have been shown in former years, but the foliage was particularly fine, and some of the varieties were very showy, and highly ornamental. The very fine collection from W. T. Andrews was a great attraction; the following named varieties were very striking:

Barillet.	Dr. Lindley.
De Humboldt.	Duc de Morny.

Flora.	Mrs. Dombrain.
Gaerti.	Princess of Teck.
Impératrice Eugénie.	Quadricolor.
Laingii.	Triomphe de l' Exposition.
Lepeschkinei.	Vesta.

FERNS were exhibited by F. L. Ames, Hovey & Co., and J. Warren Merrill. Those exhibited by Mr. Ames were the handsomest plants ever shown, and comprised the following fine varieties:

Adiantum amabile,
" *assimile*,
" *concinnum latum*,
" *cuneatum*,

a charming group, all of them well adapted for specimen culture.

Davallia Mooreana, described in the TRANSACTIONS for 1875, Part II, p. 69.

Gleichenia Dichotoma.—The *Gleichenias* constitute one of the most beautiful groups belonging to the whole family of Ferns, and for decorative and exhibition purposes are among the very best. An excellent article on the genus may be found in "The Garden," Vol. IX, p. 445.

Gleichenia speluncæ.

Gymnogramme Peruviana argyrophylla.—Silvery-grey on both surfaces; a splendid fern.

Platycerium alcicorne majus.—The habit of this fern is so curious, that it is almost indispensable in every collection.

From Hovey & Co. came

Adiantum trapeziforme,	*Davallia Tyermanni*,
Alsophila australis,	*Hypolepis distans*,
" *Van Geerti*,	*Lomaria gibba*,
Asplenium Fabianum,	*Pteris scaberula*,
Davallia Mooreana,	

which were well grown specimen plants.

SIX NAMED NEW VARIETIES were shown by J. Warren Merrill. They were *Anemia adiantifolia*, *Cheilanthes Clevelandii*, *C. Alabamensis*, *Aleuritopteris tricolor* (?), *Dictyogramme Japonica variegata*, *Gleichenia circinata glauca.*

ADIANTUMS.—Hovey & Co., were the only exhibitors, with *A. Farleyense*, *A. cuneatum*, *A. trapeziforme*, *A. decorum*, *A. concinnum* and *A. concinnum latum*, six fine ferns.

TREE FERNS.—Very fine specimens were shown by J. Warren Merrill and Hovey & Co.

March 25th, J. Warren Merrill exhibited a fine plant of *Athyrium Goringianum pictum*, a greenhouse fern from Japan, of very easy culture, and said to be well adapted for ferneries, rooms, or table ornaments. June 3d, William Gray, Jr., exhibited *Polypodium* (*Niphobolus*) *lingua corymbifera*, a very rare fern from Japan.

At the Annual Exhibition, E. H. Hitchings showed the following named rare forms of *Botrychium ternatum:*

No. 1. "With the two lateral primary divisions of the sterile frond changed into long-stalked fertile fronds." See "Gray's Manual."

No. 2. With three fertile fronds on the stem of the sterile frond.

No. 3. With two sterile, and two fertile fronds on the same stem.

Nos. 4 and 5. With sterile fronds, each bearing on its stem two fertile fronds.

No. 6. With double fertile frond.

DRACÆNAS were exhibited by Hovey & Co. The plants were of medium size, well grown, and in good order. The varieties were *Youngii*, *Shepherdii*, *amabilis*, *imperialis*, *Regina* and *stricta*.

PALMS.—A very fine pair were shown by William Gray, Jr.—*Livistonia Borbonica* and *Chamædorea elegantissima*. Hovey & Co. also exhibited a pair.

AGAVES.—Two good collections were shown by E. S. Rand, Jr., who brought *A. coccinea*, *A. micracantha*, *A. Xalapensis*, *A. striata*, *A. Antillarum* and *A. Verschaffelti*, and Hovey & Co., who exhibited *A. medio picta*, *A. cyanea*, *A. Nissonii*, *A. applanata*, *A. heteracantha cœrulea*, and *A. Bessereriana candida*. Of late years, considerable attention has been given to this fine class of ornamental plants, which, for outside decoration, either in tubs or plunged in beds, have scarcely an equal, and are quite as well adapted for conservatories and halls.

CACTI.—A very interesting collection was shown by John C. Hovey, which were neatly and correctly labelled, and added much to the interest of the exhibition. In the collection we noticed the following species and varieties not mentioned in our last report:

Cereus Jamaicensis.
Echinopsis Schethasii.
Mammillaria bicolor.
" sp. No. 1, New Mexico.
Opuntia fragilis.
Opuntia hystrix.
" *macrodasys minima.*
" *speciosa.*
" *tenuispina.*

Succulents (other than Agaves and Cacti). The only exhibitor was John C. Hovey, whose specimens were selected with much care, and contained the following species and varieties not mentioned in our last report:

Aloe albocincta.	*Haworthia coarctata.*
" *humilis.*	*Hechtea Ghiesbreghtii.*
" *rhodacantha.*	*Littœa juncifolia.*
Crassula perpossa.	*Mesembryanthemum echinatum.*
Gasteria Bowieana.	*Rhipidodendron plicatile.*
" *maculata.*	*Sempervivum dodrantale.*

Best new Pot Plant.—F. L. Ames, exhibited *Cypripedium Sedeni.*

Celosia Pyramidalis.—Four good plants were shown by C. M. Atkinson. In Europe these are largely grown in pots for exhibition, and also for table decoration; they grow freely in the open ground and are highly ornamental for borders, and very showy when arranged with other plants.

Dahlias.—S. G. Stone and C. M. Atkinson have been the only contributors; the display has been less than in previous seasons.

Bouquets.—Hovey & Co., James Nugent, Mrs. E. M. Gill, Mrs. S. Joyce and James O'Brien have been the contributors. The Hand Bouquets have been very good—indeed, they have been first class all through the season, while on the other hand, the Parlor Bouquets have been very poor. We hope another season to see a great improvement in the latter.

Baskets of Flowers.—Hovey & Co., Mrs. A. D. Wood, Mrs. S. Joyce and Mrs. E. M. Gill, have been the principal contributors. As in past seasons, baskets have been quite a feature of the weekly exhibitions, and the efforts of the contributors seem to be appreciated by all.

Table Designs have been shown by Hovey & Co., Mrs. A. D. Wood, Mrs. S. Joyce and Mrs. E. M. Gill. There has been much sameness in the designs, and the Committee think that there is room for improvement in this direction, and hope another season will witness it.

Rustic Stands.—Two very fine stands, arranged in good taste with choice plants, were shown by Hovey & Co. and W. J. Vass.

Evergreen Trees and Shrubs, were shown by W. C. Strong and J. W. Manning. The collection shown by Mr. Strong contained fifty varieties of Coniferous Evergreens, most noticeable

among which were *Retinispora pisifera aurea*, six feet high—a fine specimen of uncommonly bright color; *R. obtusa aurea*, a dwarf compact variety, also very golden; several other *Retinisporas* of merit; some fine new Spruces and *Piceas*, noticeable among which was *P. Nordmanniana;* also *Thujas* in variety, among which *T. occidentalis variegata* was most conspicuous.

Chrysanthemums.—The exhibition was a decided success. At no time have such good plants been shown as on this occasion; the specimens were full of vigor and health, and finely clothed with flowers. The value of this flower for autumn decoration, yielding as it does, a supply of flowers, when so many other things are failing, cannot be over estimated.

New and Rare, or Fine Specimen Plants.—William Gray, Jr., brought a small plant of *Cypripedium niveum* (Snow-white Lady's Slipper). H. Noel Humphreys says, in "The Garden," Vol. IX, p. 525, "This is a little gem, and a general favorite wherever it is grown. In habit it is so nearly like *C. concolor* that Mr. Ellis, who obtained many of the first plants introduced, mistook it for *C. concolor* until it flowered. The foliage is, however, a little longer, and rather deeper in color; the flowers are borne on one or two flowered scapes, which vary from three to six inches in height, sometimes even higher; the sepals are white in front, suffused with delicate rose-flesh at the base, which gives them a charming opaline appearance, and at the back they are suffused with green and blotched with dull purple; the sepals are pure white, nearly two inches long, and are dotted at the base with purple; lip oblong, slightly pointed, not unlike a wren's egg, but larger, pure white, with minute purple dots."

Mr. Gray has also shown *Cypripedium biflorum*, a handsome species from India, in the way of *C. barbatum*, but with more variegated foliage. The blossoms are produced on a spike; sometimes two flowers appear on one stem; the top petal is very handsome, the upper part being of a beautiful white, the other part of the flower purplish brown. It will keep for weeks in good condition.

James Comley has shown,

Allamanda Weddelliana.—New and the first time exhibited.

Anthurium crystallinum, a very rich ornamental plant; leaves of a rich, dark green color, the midrib and principal veins being bordered on each side with a beautiful bright silvery white band. The

young leaves are of a rich bronzy shade, forming an effective contrast with the more mature foliage.

Anthurium Scherzerianum, a very striking and attractive plant, producing beautiful scarlet floral spathes, each of which remains a long time fresh and brilliant.

Bougainvillea glabra, a fine plant.

Dracœna metallica.—This is considered one of the finest of the dark leaved *Dracœnas*, and is among the very best of decorative plants. New, and now first shown.

Eriostemon buxifolium.—A very handsome New Holland shrub.

Fragaria variegata.

Hedychium flavum.

Hibiscus Rosa-sinensis cruentus, a remarkably fine and showy stove plant; flowers of moderate size, compact and double; of a very rich crimson red.

Hydrangea Otaksa, a Japan species, very double; with pink flowers and blossoms in clusters. The plant exhibited was a very fine specimen with thirty-seven full heads of bloom.

Hydrangea stellata fl. pl.

Lapageria alba.

Rhododendron Aucklandi.—This is exceedingly rare, and one of the handsomest of the Himalayan series; its fine large white flowers are sometimes from four to six inches in diameter. New, and now first exhibited.

R. formosum grandiflorum, a free blooming variety, with finely formed, pure white flowers. A neat growing kind, and very useful for conservatory decoration.

R. Princess Alice.—A neat, dwarf, bushy growing variety, of the *ciliatum* type, with comparatively small leaves, and producing clusters of deliciously scented bell-shaped white flowers, flushed with pink on the outer surface.

R. Princess Royal.—A handsome and distinct variety, of neat, compact growth, with clusters of richly shaded rose colored, funnel-shaped flower tubes.

Sempervivum arboreum variegatum.

Edward S. Rand, Jr., has shown.

Aloe elegans tenuoir.

Aphelandra Fascinator, a fine species with very ornamental foliage as well as magnificent flowers; the leaves are rich dark green, beautifully banded with silvery white, and underneath of uniform

purplish violet; the spikes of bloom are very large and of a dazzling vermilion color.

Cypripedium niveum.

Lycopodium Japonicum (new).

Mandevillea suaveolens, a beautiful white flowering sweet scented climber.

Narcissus Bulbocodium.

Rogiera cordata.

Tacsonia Buchanani.

Thunbergia Harrisi and *T. laurifolia*, two beautiful stove evergreen climbers.

C. M. Atkinson has shown,

Anthurium Scherzerianum, a very handsome plant.

Bletia Tankervilliæ or *Phaius grandifolius*, a very fine plant with twelve spikes of flowers and at least two hundred and fifty blooms.

Dionæa Muscipula (Venus' Fly-trap), a very interesting plant, and the best specimen ever shown. A very excellent article on the *Dionæa* may be found in the "Gardener's Monthly," Vol. X, p. 229.

Franciscea calycina major, a very handsome stove evergreen shrub.

Rhododendron Mrs. Shuttleworth, also very fine.

Sarracenia Drummondi, a very fine plant indeed. This is an evergreen perennial from Florida, the leaves or pitchers of which grow quite erect, and from a foot to two and a half feet high; they are of a bright green color, and at the upper expanded end are variegated in a reticulated form with white, red, and green, the hood, or lid, which is much undulated, being similarly marked; the flower is crimson purple.

Sarracenia flava, an attractive species, also from Florida, with erect leaves, about two feet high, and having at the apex a large open throat, with a broad lid of a uniform bright green color. One of the best.

Sarracenia variolaris, a free growing erect plant, though not so attractive as some others, but worthy of a place in every collection. The flowers are of an apple green tint.

These three plants were exceedingly interesting and attracted much attention.

Toxicophlæa spectabilis.

Thyrsacanthus rutilans, a very handsome plant, in fine bloom.

From Hovey & Co.,

Aloe saponaria, in bloom.

Bougainvillea spectabilis, a splendid conservatory climber.

Clematis azurea grandiflora.

" *florida fl. pl.*

" *Lord Londesborough*.

" *Sophia fl. pl.*

" *Stella*.

" *Veitchii*.

Epiphyllum Hoveyi, a fine seedling variety.

Monstrosa deliciosa, flower and leaf.

Ornithogalum thyrsoides alba, a fine species, very ornamental. The flowers are white, and appear in spikes from six to eight inches long.

Pelargonium Button-hole, recommended as a very desirable variety.

Rudgea macrocephala (new) with pure white flowers, and large glossy foliage.

From C. S. Sargent, a very fine plant of *Phormium tenax variegatum*, in flower. This is a finely variegated form of the well known New Zealand Flax; of erect, stately growth, and very ornamental, the fine broad leaves being ornamented with conspicuous broad stripes of creamy white, running their whole length, and contrasting well with the light, shining green, ground color. It is a noble plant, and well adapted for decorative purposes. This was the first time that it had been shown in flower. A small mat, made by the native Maoris of New Zealand from the fibre of this plant, was sent in by Miss H. E. Stevenson and exhibited at the meeting of the Society, showing the character of the fibre. Mr. Sargent also exhibited *Proteinophallus Rivieri*, a finely grown specimen of a curious Aroid, of very striking appearance.

From A. S. Lewis, a very fine seedling Primula,—flowers double white; large and fine; in size quite equal to a large double daisy; fine stalk, well above the foliage. It would be very valuable as a florist's flower.

From J. H. Woodford, *Veltheimia viridifolia*, a bulbous greenhouse plant from the Cape of Good Hope. Also, the following fine Clematis:

Miss Bateman.—White, with chocolate-red anthers.

Lord Londesborough.—Rich mauve, with maroon stripes.

Albert Victor.—Deep lavender, with pale bar.

John Gould Veitch.—Light blue; flowers large and double.

Sophia.—Pale lavender.

From Joseph Clark, some magnificent flowers of Clematis *Lucie Lemoine*, double white; rosette formed; very fine: *John Gould Veitch: Henryi*, pure white or creamy white; very fine indeed.

From H. Weld Fuller, *Guzmannia picta*, a pretty species.

From Jackson Dawson, *Calypso borealis*, a small but extremely pretty plant, and deserving a place in every garden. Also, *Xiphion* (*Iris*) *tingitanum*, and *Fressia* (*Tritonia*) *Leichtliniana.*

From Waldo O. Ross, *Cereus roseus grandiflorus.*

From J. F. Rogers, a very fine specimen plant of *Rhynchospermum jasminoides.*

From the Perkins Institution for the Blind, a fine spike of flowers of *Crinum amabile.*

From A. McLaren, a good plant of *Tabernæmontana coronaria fl. pl.*

From Daniel Duffy, a very fine display of *Amaryllis Belladonna.*

From A. McLaren, A. P. Calder, and J. G. Barker, magnificent trusses of bloom of *Hydrangea paniculata grandiflora*, one of the very best of hardy shrubs.

From J. McTear, *Campanula isophylla.*

From M. H. Merriam, *Lapageria alba.*

From F. L. Andrews, *Zephyranthes candida*, a very pretty, white-flowered bulbous plant.

From Francis Parkman, *Pyrus malus baccata fl. pl.*, from Japan, a beautiful variety with delicate pink flowers; new and rare; also, very fine Clematis, and a magnificent display of Aquilegias, the most beautiful varieties ever shown.

In conclusion, we call special attention to the new rule of the Flower Committee, No. 5, and to the change in the exhibitions for the earlier months of the year, from the second to the first Saturday of the month; also, to the fact that all who wish to compete for the Rose prizes must apply to the Superintendent for the boxes, on or before May 1st. We hope all the exhibitors will give the SCHEDULE their most careful attention, and we again remind them that if they wish a report of the plants and flowers exhibited, they must not neglect to hand a list of the same to the Committee.

For the Committee.

JOHN G. BARKER, Chairman.

PRIZES AND GRATUITIES AWARDED FOR PLANTS AND FLOWERS.

January 1.

Gratuities: —

To James O'Brien, for Cyclamen,	$1 00
James Comley, for *Amaryllis Hendersoni*,	1 00
Miss S. W. Story, for Cut Flowers,	1 00
James Comley, " " "	2 00
John B. Moore, " " "	2 00
Mrs. C. N. S. Horner, for Native Flowers,	2 00
W. E. Endicott, for *Urceolina pendula*,	1 00
A. S. Lewis, for Seedling Primula,	2 00
Mrs. S. Joyce, for Dish of Flowers,	1 00
Mrs. E. M. Gill, for Cut Flowers and Plant,	2 00
E. S. Rand, Jr., " rare Orchids,	8 00
" " " " *Thunbergia Harrisi*,	1 00

January 8.

Gratuities: —

To Mrs. A. D. Wood, for Cut Flowers,	2 00
John B. Moore, " " "	2 00
Mrs. S. Joyce, " " "	2 00
James Comley, " " "	2 00
Miss S. W. Story, " " "	1 00
Mrs. E. M. Gill, " " "	2 00
John B. Moore, for Amaryllis sp.,	2 00
Twombly & Sons, for Rose Buds,	1 00
L. H. Foster, " " "	1 00
E. S. Rand, Jr., " Orchids,	2 00

January 15.

Gratuities: —

To James Comley, for *Lycaste Skinneri*,	2 00
E. S. Rand, Jr., for *Aphelandra Fascinator*,	2 00

To Miss S. W. Story,	for Cut Flowers,	$1 00
James McTear,	" " "	2 00
James Comley,	" " "	3 00
Mrs. A. D. Wood,	" " "	2 00
John B. Moore,	" " "	2 00
" "	" Amaryllis Cleopatra,	2 00
Mrs. E. M. Gill,	" Basket of Flowers,	2 00
Mrs. S. Joyce,	" " "	2 00
L. H. Foster,	for Rose Buds,	1 00

JANUARY 22.

Gratuities: —

To John B. Moore,	for specimen Azalea,	3 00
James Comley,	" Azalea,	1 00
" "	" Lily of the Valley,	2 00
" "	" choice Cut Flowers,	3 00
Mrs. E. M. Gill,	" Cut Flowers,	2 00
John B. Moore,	" " "	2 00
James McTear,	" " "	2 00
Mrs. A. D. Wood,	" " "	2 00
Mrs. S. Joyce,	" " "	2 00
" " "	" *Amaryllis fulgida*,	1 00
Francis Putnam,	" " Seedlings,	1 00
B. G. Smith,	" Carnations,	1 00
E. S. Rand, Jr.,	" Orchids,	5 00

JANUARY 29.

Gratuities: —

To J. H. Woodford,	for *Veltheimia viridiflora*.	1 00
James Comley,	" Stand of Cut Flowers,	3 00
A. P. Calder,	" Lily of the Valley,	3 00
B. G. Smith,	" Carnations,	1 00
Mrs. E. M. Gill,	for Cut Flowers,	1 00
James Comley,	" " "	2 00
James McTear,	" " "	2 00
Mrs. A. D. Wood,	" " "	2 00
Miss S. W. Story,	" " "	1 00
Mrs. S. Joyce,	" " "	2 00
John B. Moore,	" " "	3 00
James Comley,	" *Cymbidium aloifolium*,	2 00

To E. S. Rand, Jr., for *Cattleya amethystoglossa*,		$5 00
J. F. Rogers,	" *Dendrobium nobile*,	1 00
C. M. Atkinson,	" Plant and Violets,	2 00

FEBRUARY 5.

Gratuities :—

To A. P. Calder, for Forced Lilacs,		1 00
B. G. Smith, for Carnations,		1 00
Mrs. E. M. Gill, for Cut Flowers,		1 00
Mrs. S. Joyce,	" " "	1 00
Miss S. W. Story,	" " "	1 00
John B. Moore,	" " "	2 00
James Comley,	" " "	2 00
John B. Moore,	" Amaryllis Bayard,	1 00
Francis Putnam,	" Seedling Amaryllis,	1 00
Jackson Dawson,	" Choice Flowers,	2 00

FEBRUARY 12.

CYCLAMENS.—For the best six, in pots, to C. B. Gardiner,	6 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to James O'Brien,	5 00
For the second best, to Mrs. S. Joyce,	4 00

Gratuities :—

To E. S. Rand, Jr., for Orchids,		7 00
C. T. Hubbard,	" "	1 00
Hovey & Co.,	" Plants,	2 00
James Comley,	" "	3 00
John F. Rogers,	" "	8 00
Marshall P. Wilder, for Azaleas,		2 00
John B. Moore, for Amaryllis Aurora,		1 00
James Cartwright, for *Cœlogyne cristata*,		1 00
James Comley, for Cut Flowers,		4 00
Miss S. W. Story,	" "	1 00
Hovey & Co.,	" "	1 00
B. G. Smith,	" "	1 00
L. H. Foster, for Roses,		1 00
C. B. Gardiner, for Cyclamen,		1 00
James O'Brien,	" "	1 00
Francis Putnam,	" Amaryllis,	2 00
Mrs. A. D. Wood, for Vase of Flowers,		1 00

February 19.

Gratuities:—

To Francis Putnam,	for Amaryllis,	$2 00
Mrs. E. M. Gill,	" "	1 00
John B. Moore,	" " Regina,	1 00
" " "	" specimen Azalea,	3 00
Mrs. S. Joyce,	" Basket of Flowers,	2 00
John B. Moore,	" Cut Flowers,	1 00
Mrs. A. D. Wood,	" "	2 00
B. G. Smith,	" "	1 00
Mrs. E. M. Gill,	" "	1 00
James Comley,	for Plants,	3 00
" "	" Hybrid Perpetual Roses,	4 00
E. S. Rand, Jr.,	for *Phalænopsis Schilleriana*,	2 00
James O'Brien,	" Cyclamen,	1 00
C. M. Atkinson,	" Hyacinths,	3 00
" "	" Pansies,	1 00

February 26.

Gratuities:—

To E. S. Rand, Jr.,	for *Odontoglossum pulchellum*,	2 00
John B. Moore,	for Cut Flowers of Azaleas—twenty-six choice varieties,	3 00
Miss S. W. Story,	for Cut Flowers,	1 00
Mrs. S. Joyce,	" " "	2 00
Mrs. E. M. Gill,	" " "	2 00
Mrs. A. D. Wood,	" " "	2 00
James Comley,	for Cut Flowers,	4 00
Francis Putnam,	for Amaryllis,	2 00
Hovey & Co.,	" Seedling Azalea,	2 00
L. H. Foster,	" Rose Buds,	1 00
James Comley,	" Roses in pots,	10 00
" "	" Hyacinths,	1 00
" "	" *Erica Cavendishiana*,	2 00
Thomas Tapper,	" Cineraria,	1 00

March 4.

Gratuities:—

To James Comley,	for choice Hybrid Perpetual Roses—Cut Flowers,	4 00

To C. M. Atkinson, for Hyacinths,	$2 00
C. B. Gardiner, for specimen Cyclamen,	4 00
Mrs. C. N. S. Horner, for Native Plants,	1 00
James Comley, for Plants,	2 00
James Cartwright, for *Lycaste Skinneri*,	2 00
John B. Moore, for specimen Azalea,	2 00
Marshall P. Wilder, for new Azaleas,	3 00
E. S. Rand, Jr., for Cherokee Rose,	1 00
Hovey & Co., for *Azalea ovata*,	1 00
C. M. Atkinson, for *Bletia Tankervilliæ*,	5 00
Francis Putnam, " Seedling Amaryllis,	1 00
J. B. Moore, " Cut Flowers and Amaryllis,	3 00
Mrs. E. M. Gill, " " "	2 00
Mrs. A. D. Wood, " " "	1 00
Mrs. S. Joyce, " " "	2 00
Miss S. W. Story, " " "	2 00
James Comley, " " "	3 00

MARCH 11.

CAMELLIAS.—For the best display of named varieties. Cut Flowers, not less than twenty blooms, to C. M. Atkinson,	6 00
For the second best, to Hovey & Co.,	5 00
ORCHIDS — WINTER BLOOMING. — For the best three varieties, to E. S. Rand, Jr.,	10 00
For the second best, to E. S. Rand, Jr.,	8 00
PARLOR BOUQUETS.—For the best pair to James Nugent.	5 00

Gratuities: —

To James Comley, for Hyacinths,	2 00
" " " Hybrid Perpetual Rose, in pot.	2 00
" " " Basket of Roses,	4 00
Francis Putnam, " Seedling Amaryllis,	1 00
James Cartwright, for *Lycaste Skinneri*,	3 00
Mrs. S. Joyce, " Cut Flowers,	2 00
E. S. Rand, Jr., " " "	2 00
James Comley, " " "	3 00
Hovey & Co., " " "	1 00
Miss S. W. Story, " " "	2 00

To Mrs. E. M. Gill,	for Cut Flowers,	$2 00
Mrs. A. D. Wood,	" " "	2 00
John B. Moore,	" " "	3 00
" " "	" Azaleas,	3 00
M. P. Wilder,	" "	5 00
J. F. Rogers,	" "	3 00
C. M. Atkinson,	" *Thyrsacanthus rutilans*,	2 00
Miss M. B. Tobey,	" *Thunbergia Harrisi*,	1 00

March 18.

Gratuities: —

To L. H. Foster,	for Rose Buds,	1 00
S. Neil,	" " "	2 00
Mrs. C. N. S. Horner,	for Native Flowers,	1 00
Mrs. A. D. Wood,	" Vase of "	1 00
Mrs. S. Joyce,	" Dish of "	1 00
James Comley,	for choice Cut Flowers,	5 00
E. S. Rand, Jr.,	" " "	2 00
Mrs. E. M. Gill,	" " "	1 00
John B. Moore,	" " "	2 00
Miss S. W. Story,	" " "	1 00
James Comley,	" Plants,	2 00
" "	" *Anthurium crystallinum*,	3 00
John B. Moore,	" specimen Azaleas,	5 00
" " "	" " Hybrid Perpetual Rose,	3 00
D. Zirngiebel,	" Pansies,	1 00

March 25.

Gratuities: —

To James Comley,	for Azaleas,	2 00
" "	" Cut Flowers,	2 00
Mrs. E. M. Gill,	" " "	1 00
Miss S. W. Story,	" " "	1 00
Mrs. S. Joyce,	" " "	1 00
J. Warren Merrill,	" rare Fern,	2 00
Hovey & Co.,	" Plants,	1 00
John B. Moore,	" Hybrid Perpetual Roses—a very fine display of Cut Flowers,	2 00

To James Comley,	for	superb Basket of Roses,	$5 00
John B. Moore,	"	specimen Azaleas,	3 00
C. M. Atkinson,	"	*Trichopilia suavis*,	1 00
" "	"	specimen Pelargonium,	3 00
C. S. Sargent,	"	*Proteinophallus Rivieri*,	2 00
E. S. Rand, Jr.,	"	Cherokee Roses,	1 00
M. P. Wilder,	"	new Azaleas,	3 00

April 1.

Gratuities: —

To John B. Moore,	for	Hybrid Perpetual Roses—fine Cut Flowers,	3 00
Mrs. S. Joyce,	for	Table Design,	1 00
James Comley,	"	choice Cut Flowers,	4 00
Miss S. W. Story,	"	" " "	1 00
Mrs. E. M. Gill,	"	Cut Flowers,	1 00
Mrs. A. D. Wood,	"	Dish of Cut Flowers,	2 00
L. H. Foster,	"	Stocks,	1 00
Hovey & Co.,	"	Plants,	2 00

AZALEA EXHIBITION.

April 8.

Indian Azaleas.—For the best six named varieties, in pots, to Marshall P. Wilder,	$25 00
For the best six named varieties, in eight inch pots, to John B. Moore,	15 00
For the second best, to Hovey & Co.,	10 00
For the best single specimen, to John B. Moore,	10 00
Greenhouse Plants.—For the best six, in bloom, to C. M. Atkinson,	20 00
For second best, to E. S. Rand, Jr.,	15 00
Cinerarias.—For the best six varieties, in pots, to C. M. Atkinson,	8 00
Polyanthus.—For the best six, in pots, to C. M. Atkinson,	5 00
Spring Flowering Bulbs.—For the best collection, in pots, the second prize, to Hovey & Co.,	8 00
Hyacinths.—For the best nine, in pots, the second prize, to Hovey & Co.,	4 00

For the best six, in pots, the second prize to Hovey & Co.,	$3 00
For the best three, in pots, to Hovey & Co.,	3 00
For the best two, in pots, the second prize to Hovey & Co.,	1 00
For the best single specimen, to Hovey & Co.,	1 00
NARCISSUS.—For the best six pots, three bulbs in a pot, to Hovey & Co.,	1 00
For the best three pots, the second prize to Hovey & Co.,	3 00
TULIPS.—For the best three pots, the second prize to Hovey & Co.,	2 00
BASKET OF FLOWERS.—For the best arranged, to Mrs. A. D. Wood.	4 00
For the second best, to Mrs. S. Joyce,	3 00

Gratuities:—

To George E. Davenport,	for Native Flowers,	1 00
James Comley,	" choice Cut Flowers,	4 00
" "	" *Aerides odoratum*,	3 00
" "	" Azaleas,	2 00
Mrs. E. M. Gill,	" Cut Flowers,	2 00
John B. Moore,	" " "	2 00
E. S. Rand, Jr.,	" " "	1 00
L. H. Foster,	" " "	1 00
E. S. Rand, Jr.,	" Orchid,	2 00
J. F. Rogers,	" collection of Plants,	4 00
D. Zirngiebel,	" Pansies,	1 00
H. E. Smith,	" Amaryllis,	1 00
Hovey & Co.,	" *Bougainvillea spectabilis*,	1 00

APRIL 15.

Gratuities:—

To E. S. Rand, Jr.,	for choice Cut Flowers,	2 00
James Comley,	" " "	3 00
Mrs. S. Joyce,	" " "	2 00
Mrs. E. M. Gill,	" " "	2 00
Mrs. A. D. Wood,	" " "	2 00
John B. Moore,	" Roses, " "	2 00
James Comley,	" Plants,	3 00

To H. Weld Fuller, for *Guzmannia picta*,	. . .	$1 00
George E. Davenport, for Native Flowers,	. .	1 00
Mrs. C. N. S. Horner, " " "	. . .	2 00
Hovey & Co., " Hyacinths,	. . .	1 00

April 22.

Gratuities: —

To E. S. Rand, Jr., for rare Orchids,	. . . .	3 00
L. H. Foster, " Rose Buds,	. . . .	1 00
James Comley, " Cut Flowers,	. . . .	4 00
John B. Moore, " " "	. . . .	3 00
Mrs. A. D. Wood, " " "	. . . .	3 00
Mrs. E. M. Gill, " " "	. . . .	2 00
Mrs. S. Joyce, " Dish of "	. . . .	1 00
James Comley, " Plants,	. . . .	3 00
George E. Davenport, for Native Flowers,	. .	1 00

April 29.

Gratuities: —

To James Comley, for choice Cut Flowers,	. . .	5 00
Mrs. A. D. Wood, " " "	. . .	2 00
Mrs. S. Joyce, " " "	. . .	2 00
Mrs. E. M. Gill, " " "	. . .	2 00
Miss S. W. Story, " " "	. . .	1 00
George E. Davenport, for Native Plants,	. . .	1 00
Mrs. C. N. S. Horner, " " "	. . .	1 00
James Comley, " choice "	. . .	3 00
" " " Pansies,	. . .	1 00
B. G. Smith, " "	. . .	1 00
John B. Moore, " Seedling Gloxinias,	. .	3 00
E. S. Rand, Jr., " Orchids,	. . . .	8 00

May 6.

Gratuities: —

To E. S. Rand, Jr., for rare Orchid,	. . . .	3 00
Norton Brothers, " Plants,	. . . .	3 00
James Comley, " "	. . . .	2 00
Mrs. E. M. Gill, " "	. . . .	1 00
Edward B. Clapp, " Pansies,	. . . .	1 00

To John B. Moore,	for	Gloxinias,	$1 00
Norton Brothers,	"	Gladiolus,	1 00
C. M. Atkinson,	"	Hyacinths,	2 00
" "	"	six fine pots of Pansies,	3 00
" "	"	*Anthurium Scherzerianum*,	5 00
Geo. E. Davenport,	"	Native Plants,	1 00
E. S. Rand, Jr.,	"	Cut Flowers,	2 00
James Comley,	"	" "	5 00
Mrs. E. M. Gill,	"	" "	2 00
Hovey & Co.,	"	" "	2 00
Mrs. A. D. Wood,	"	" "	3 00
Miss S. W. Story,	"	" "	2 00
Mrs. S. Joyce,	"	" "	2 00
Miss A. C. Wheeler,	"	" "	1 00
L. H. Foster,	"	" "	1 00

PELARGONIUM EXHIBITION.

May 13.

Pelargoniums.—For the best six named Zonale varieties, not variegated, to William Gray, Jr.,	$15 00
For the second best, to " " "	10 00
For the best six named variegated Zonale varieties, to William Gray, Jr.,	15 00
For the second best, to Hovey & Co.,	10 00
For the best six named Double Zonale varieties, to Hovey & Co.,	15 00
For the second best, to James Comley,	10 00
Spring Herbaceous Plants (Open culture).—For the best display of named species and varieties, one bottle of each variety, to E. S. Rand, Jr.,	6 00
Calceolarias.—For the best six varieties, in pots, to C. M. Atkinson,	10 00
Table Design.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce,	4 00
For the second best, to Mrs. E. M. Gill,	3 00
Tulips.—For the best twenty-five named Flowers, to C. M. Atkinson,	5 00

Special Prizes for Pelargoniums.

For the best six named Zonale varieties, not variegated, to Hovey & Co.,	$25 00
For the second best, to Hovey & Co.,	15 00
For the best six Zonale varieties, variegated, to Hovey & Co.,	25 00
For the best specimen Zonale, variegated, to Hovey & Co.,	10 00

Gratuities:—

To Waldo O. Ross, for *Cereus roseus grandiflorus*,	1 00
George E. Davenport, for Native Flowers,	1 00
Mrs. C. N. S. Horner, " " "	2 00
John F. Rogers, for *Rhyncospermum jasminioides*,	5 00
James Comley, " Plants,	4 00
John F. Rogers, " "	4 00
John B. Moore, " Seedling Gloxinias,	2 00
Norton Brothers, for Gladiolus,	1 00
E. S. Rand, Jr., for choice Orchids,	2 00
J. C. Hovey, for *Narcissus bicolor*,	1 00
C. M. Atkinson, for fine plants of *Lilium longiflorum*,	3 00
Mrs. Sherman, " Pelargonium,	1 00
J. S. Richards, " Tulips,	2 00
Miss A. C. Kenrick, for Magnolias,	1 00
Joseph Clark, for Clematis,	2 00
J. F. Rogers, for Hyacinths,	1 00
William Gray, Jr., for Pelargoniums,	12 00
James Comley, for Cut Flowers,	4 00
Miss A. C. Wheeler, for Cut Flowers,	1 00
John B. Moore, " " "	2 00
Miss S. W. Story, " " "	1 00
Mrs. A. D. Wood, " " "	3 00

MAY 20.

Gratuities:—

To Miss A. C. Kenrick, for Flowering Shrubs,	1 00
Francis Parkman, for Spring Flowering Plants,	2 00
E. S. Rand, Jr., for rare Orchid,	2 00
Miss S. W. Story, for Floral Star,	2 00

To Benjamin G. Smith, for Pansies,	$1 00
William Gray, Jr., for *Cattleya Mossiæ*,	2 00
Mrs. S. Joyce, for stand of Cut Flowers,	2 00
Miss A. C. Wheeler, for Cut Flowers,	1 00
James Comley, " " "	3 00
Mrs. E. M. Gill, " " "	2 00
Mrs. A. D. Wood, " " "	3 00
John B. Moore, " " "	3 00
Institution for the Blind, for *Crinum amabile*,	1 00
Geo. E. Davenport, for Native Flowers,	1 00
E. H. Hitchings, " " "	1 00
John Robinson, " " "	3 00

MAY 27.

Gratuities:—

To Mrs. C. N. S. Horner, for Native Flowers,	2 00
George N. Smith, " " "	1 00
George E. Davenport, " " "	1 00
Miss C. L. Tallant, " " "	1 00
John B. Moore, for Plants,	2 00
Hovey & Co., " "	2 00
E. S. Rand, Jr., for Spring Herbaceous Plants,	1 00
Francis Parkman, for " " "	2 00
E. S. Rand, Jr., for Orchids,	4 00
Miss A. C. Wheeler, for Cut Flowers,	1 00
Mrs. E. M. Gill, " " "	1 00
Miss S. W. Story, " " "	2 00
James Comley, " " "	4 00
Mrs. A. D. Wood, " " "	2 00
Mrs. S. Joyce, " " "	2 00
James Comley, for Veronica Blue Gem,	2 00
William Gray, Jr., for *Cypripedium biflorum*.	1 00
Miss A. C. Kenrick, for Flowering Shrubs,	2 00
B. G. Smith, for Pansies,	1 00
Mrs. L. P. Weston, for Pansies,	1 00

JUNE 3.

PELARGONIUMS.—For the best six named show varieties, in pots, the second prize to J. B. Moore,	8 00

TREE PÆONIES.—For the best six named varieties, to M. P. Wilder,	$5 00
For the second best, to Hovey & Co.,	4 00
CUT FLOWERS.—For the best display, filling 150 bottles, to James Comley,	6 00
For the second best, to W. K. Wood,	5 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. A. D. Wood,	4 00
For the second best, to Mrs. S. Joyce,	3 00
PARLOR BOUQUETS.—For the best pair, to James Nugent,	4 00
For the second best, to James O'Brien,	3 00
HAND BOUQUETS.—For the best pair, to Mrs. E. M. Gill,	3 00
For the second best, to James Nugent,	2 00
HARDY SHRUBS.—For the best display, to Miss A. C. Kenrick,	5 00
Third prize, to Miss S. W. Story,	3 00
RHODODENDRONS.—For the best twelve named varieties, one truss of each, to E. S. Rand, Jr.	10 00

Hunnewell Premiums.

HARDY AZALEAS.—For the best display of named varieties, to E. S. Rand, Jr.,	20 00
For the second best, to E. Shepherd,	10 00
For the third best, to B. G. Smith,	5 00

Gratuities:—

To James Comley, for Plants,	3 00
William Gray, Jr., for rare Fern,	2 00
Francis Parkman, " very fine Aquilegias,	2 00
William Richards, " *Cornus florida*,	1 00
James Comley, " *Bouyainvillea glabra*,	4 00
John Robinson, " Seedling Aloe,	1 00
E. S. Rand, Jr., " rare Orchids,	8 00
" " " Rhododendrons,	3 00
Eddie W. Mitchell, " Native Flowers,	1 00
Mrs. C. N. S. Horner, for Fernery,	1 00
Marshall P. Wilder, for Pæonies,	5 00
James Cruickshanks, for Cut Flowers,	1 00
John B. Moore, " " "	1 00
James Nugent, " " "	2 00
Miss A. C. Wheeler, " " "	1 00
Mrs. E. M. Gill, " " "	2 00

June 10.

Hunnewell Premiums.

Hardy Rhododendrons.—For the best display of named varieties, to E. S. Rand, Jr.,	$35 00
Third prize, to Joseph Clark,	10 00

Gratuities:—

To James Comley, for *Hibiscus cruentus*,	1 00
" " " choice Cut Flowers,	4 00
Miss A. C. Wheeler, for Cut Flowers,	1 00
Mrs. S. Joyce, " " "	2 00
Mrs. A. D. Wood, " " "	2 00
J. B. Moore, " " "	3 00
Hovey & Co., " " "	1 00
Miss A. C. Kenrick, " Magnolias,	1 00
Mrs. C. N. S. Horner, " Native Flowers,	3 00
C. M. Atkinson, " specimen Azalea,	10 00
H. H. Hunnewell, " Rhododendrons,	10 00
E. S. Rand, Jr., " "	3 00
J. McTear, " *Datura Knightii*,	1 00
" " " Iris,	1 00
George E. Davenport, " Native Plants,	1 00
J. H. Woodford, " Clematis,	3 00
Hovey & Co., " "	1 00
M. W. Clark, " *Myosotis*,	1 00
Joseph Clark, " Azaleas,	2 00

June 17.

Gratuities:—

To F. H. Gilson, for Native Plants,	3 00
E. S. Rand, Jr., " Rhododendrons,	5 00
James Comley, " Roses,	3 00
Miss A. C. Wheeler, for Cut Flowers,	1 00

ROSE EXHIBITION.

June 21.

Hardy Perpetual Roses. — For the best twenty-four distinct named varieties, three of each variety, to William Gray, Jr.,	$20 00
For the best twelve distinct named varieties, to James Comley,	10 00
For the second best, to J. H. Woodford,	8 00
For the best six distinct named varieties, to J. B. Moore,	5 00
For the best three named varieties, to W. Gray, Jr.,	4 00
For the second best, to James Comley,	2 00
Moss Roses. — For the best twelve named varieties, to C. M. Atkinson,	10 00
Tender Roses. — For the best twelve named varieties, to James Comley,	10 00
For the best twelve Maréchal Niel, to James Comley,	5 00
General Display. — For the best, to Francis Parkman,	15 00
For the second best, to Joseph Clark,	10 00

Hunnewell Special Prizes.

For the best six new varieties sent out since 1872, to William Gray, Jr.,	40 00
For the best six named varieties, to William Gray, Jr.,	20 00
For the second best, to C. M. Atkinson,	10 00
For the best twelve of any one variety, to William Gray, Jr.,	20 00

Gray Special Prizes.

For the best twelve of any one variety, to J. C. Chaffin,	25 00
For the best six of any one variety, to James Comley,	15 00
For the best twelve named varieties, to Francis Parkman,	25 00

Comley Special Prize.

For the best single flower of a Hybrid Perpetual Rose, to J. C. Chaffin,	5 00
Stove and Greenhouse Flowering Plants.—For the best six distinct varieties in bloom, to H. H. Hunnewell,	30 00
For the second best, to E. S. Rand, Jr.,	20 00

SPECIMEN PLANT.—Regard being had to new and rare varieties. For the best specimen plant, of a kind for which no special prize is offered, to H. H. Hunnewell, ...	$10 00
GLOXINIAS.—For the best single specimen, to Joseph Clark,	3 00
NATIVE PLANTS.—For the best display of named species and varieties, one bottle of each, to Mrs. C. N. S. Horner, ...	5 00
WARDIAN CASE.—For the best specimen, to W. H. Halliday, ...	10 00
For the second best, to Hovey & Co., . . .	8 00
FERN CASE.—For the best, not to exceed fifteen inches in diameter, to W. H. Halliday, ...	5 00
For the second best, to W. H. Halliday, . . .	4 00
SWEET WILLIAMS.—For the best thirty trusses, not less than ten distinct varieties, to Joseph Clark, .	4 00
For the second best, to James Nugent, . . .	3 00
SUMMER HERBACEOUS PLANTS.—For the best display of named species and varieties, to Francis Parkman,	5 00
For the second best, to James McTear, . . .	4 00
CUT FLOWERS.—For the best display, to Hovey & Co., .	5 00
For the second best, to W. K. Wood, . . .	4 00
For the third best, to James Comley, . . .	3 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. E. M. Gill, ...	5 00
For the second best, to Mrs. S. Joyce, . . .	4 00
For the third best, to Mrs. A. D. Wood, . .	3 00
HAND BOUQUETS.—For the best pair, to Hovey & Co., .	4 00
For the second best, to Mrs. S. Joyce, . . .	3 00

Gratuities:

To H. H. Hunnewell, for a fine display of Cut Flowers. .	3 00
Hovey & Co., for Seedling Pæonies, . . .	2 00
E. S. Rand, Jr., for *Cypripedium niveum*. . .	1 00
Mrs. E. M. Gill. " Cut Flowers.	2 00
J. B. Moore, " " "	2 00
Miss S. W. Story, " " "	2 00
E. S. Rand, Jr., " " "	1 00
Miss M.B. Tobey, " " "	1 00
E. H. Hitchings, " Native "	1 00

To H. H. Hunnewell, for Tricolor Pelargoniums,		$6 00
James Comley, "	*Hydrangea Otaksa*,	4 00
Miss C. L. Tallant, "	*Cypripedium spectabile*,	1 00
C. M. Atkinson, "	Sarracenias,	3 00
A. McLaren, "	*Tabernæmontana*,	2 00
Hovey & Co., "	collection of Plants,	6 00
James Comley, "	Pot Plants,	4 00
Miss A. C. Wheeler, for Roses,		2 00
J. B. Moore, " "		5 00
J. S. Richards, " "		4 00
Mrs. J. W. Wilcox, " "		1 00
W. H. Spooner, " "		3 00
J. B. Moore, " "		5 00
C. M. Atkinson, " "		3 00
Hovey & Co., " "		2 00
B. G. Smith, " "		2 00
Miss E. Farrington, " "		1 00
A. McLaren, " "		2 00

JUNE 24.

Gratuities: —

To Miss S. W. Story, for Cut Flowers,	1 00
E. S. Rand, Jr., " " "	2 00
W. H. Spooner, for Roses,	2 00
B. G. Smith, " "	1 00
James Comley, " "	4 00

STRAWBERRY SHOW.

JUNE 27.

CUT FLOWERS.—For the best display, filling 150 bottles, to Hovey & Co.,	$5 00
For the second best, to Mrs. E. M. Gill,	4 00
For the third best, to Mrs. A. D. Wood,	3 00
BASKET OF FLOWERS.—For the best arranged, to Hovey & Co.,	3 00
For the second best, to Mrs. S. Joyce,	2 00
PARLOR BOUQUETS.—For the best pair, to James Comley,	3 00

Gratuities: —

To William Gray, Jr.,	for Roses,	$2 00
James Comley,	" "	4 00
W. H. Spooner,	" "	2 00
E. S. Rand, Jr.,	" Cut Flowers,	2 00
James Comley,	" " "	1 00
Miss A. C. Kenrick,	" " "	1 00
Mrs. C. B. Chase,	" " "	1 00
Mrs. S. Joyce,	" " "	1 00
Harry L. Rand,	" " "	1 00
J. S. Richards,	" " "	3 00
Miss A.C. Wheeler,	" " "	1 00
Miss S. W. Story,	" *Tabernæmontana*,	2 00
Mrs.C.N.S. Horner,	" Native Flowers,	2 00
E. H. Hitchings,	" " "	3 00
George H. Smith,	" " "	2 00
Miss M. E. Carter,	" " "	1 00

JULY 1.

DELPHINIUMS.—For the best ten named varieties, to Francis Parkman,	4 00

Gratuities: —

To Francis Parkman,	for Delphiniums,	3 00
M. C. O'Shea,	" "	1 00
James Comley,	" Rhododendron,	1 00
" "	" Cut Flowers,	1 00
E. S. Rand, Jr.,	" *Stanhopea Ruckeri*,	2 00
Miss S. W. Story,	" Lilies,	1 00
Miss A.C.Wheeler,	" "	1 00
Joseph Clark,	" Sweet Williams,	2 00
Francis Parkman,	" Clematis,	1 00

JULY 8.

CUT FLOWERS. — For the best display, filling 150 bottles, to Hovey & Co.,	5 00
For the second best, to James Comley,	4 00
For the third best, to Mrs. E. M. Gill,	3 00
TABLE DESIGN. — For the best, other than a Basket of Flowers, to Mrs. S. Joyce,	3 00
For the second best, to Mrs. A. D. Wood,	2 00

Gratuities: —

To Edward S. Rand, Jr.,	for	*Vanda suavis*,	$3 00
Hovey & Co.,	"	*Phaius maculatus*,	1 00
C. T. Hubbard,	"	*Oncidium flexuosum*,	1 00
Miss S. W. Story,	"	Dish of Flowers,	2 00
Geo. N. Smith,	"	Native "	1 00
Geo. E. Davenport,	"	" "	1 00
Mrs. C. N. S. Horner,	"	" "	2 00
Francis Putnam,	"	Cut "	2 00
J. S. Richards,	"	" "	2 00
Miss A. C. Wheeler,	"	" "	1 00
Mrs. E. M. Gill,	"	" "	1 00

JULY 15.

CUT FLOWERS.—For the best display, filling 150 bottles, to Hovey & Co.,	5 00
For the second best, to W. K. Wood,	4 00
For the third best, to Mrs. E. M. Gill,	3 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce,	3 00
For the second best, to Mrs. A. D. Wood,	2 00
NATIVE PLANTS. — For the best display of named species and varieties, to Mrs. C. N. S. Horner,	5 00
For the second best, to E. H. Hitchings,	4 00

Gratuities: —

To James Comley,	for	Plants and Flowers,	2 00
" "	"	*Yucca aloifolia*,	4 00
" "	"	*Lilium Canadense*,	3 00
Calder & Wiswell,	for	*Nymphœa odorata*,	1 00
George E. Davenport,	for	Native Ferns,	3 00
Mrs. E. M. Gill,	"	Basket of Flowers,	2 00
Miss S. W. Story,	"	Lilies,	1 00
Francis Putnam,	"	" and Amaryllis,	1 00
James Nugent,	"	Cut Flowers,	1 00
James Comley,	"	" "	1 00
J. S. Richards,	"	" "	1 00
Miss L. P. Weston,	"	" "	1 00
Miss A. C. Wheeler,	"	" "	1 00

JULY 22.

ORCHIDS.—For the best three varieties in bloom, to E. S. Rand, Jr.,	$10 00
For the second best, to E. S. Rand, Jr.,	8 00
CUT FLOWERS.—For the best display, filling 150 bottles, to Hovey & Co.,	5 00
For the second best, to W. K. Wood,	4 00
For the third best, to Mrs. E. M. Gill,	3 00
BASKET OF FLOWERS.—For the best arranged, to Hovey & Co.,	3 00
For the second best, to Mrs. S. Joyce,	2 00
PARLOR BOUQUETS.—For the best pair, to James Comley,	3 00
HAND BOUQUETS.—For the best pair, to James O'Brien,	3 00
For the second best, to Mrs. E. M. Gill,	2 00

Gratuities:—

To John B. Moore, for *Caladium argyrites*,	3 00
James Comley, " Ferns,	1 00
Hovey & Co., " *Aloe saponaria*,	2 00
James O'Brien, " Hollyhocks,	3 00
E. S. Rand, Jr., " *Ixora amabilis*,	2 00
E. H. Hitchings, " *Nymphœa odorata*,	1 00
Miss A. C. Wheeler, for Cut Flowers,	1 00
E. Shepherd, " " "	1 00
J. B. Moore, " " "	1 00
Mrs. A. D. Wood, " Dish of Flowers,	2 00

JULY 29.

CUT FLOWERS. — For the best display, filling 150 bottles, to W. K. Wood,	5 00
For the second best, to James Comley,	4 00
For the third best, to Hovey & Co.,	3 00
For the best collection of fifty named varieties of Greenhouse Flowers, to Hovey & Co.,	6 00
BASKETS OF FLOWERS. — For the best arranged, to Hovey & Co.,	3 00
For the second best, to Mrs. S. Joyce,	2 00

Gratuities: —

To E. S. Rand, Jr., for *Dendrobium Devonianum*.		$2 00
J. S. Richards, " Gladioli.		3 00
W. K. Wood, " Fungi.		2 00
Mrs. E. M. Gill, " Basket of Native Flowers.		1 00
E. H. Hitchings, " " "		1 00
Mrs. C. N. S. Horner, for " "		2 00
Miss A. C. Wheeler, " Cut "		1 00
James Nugent, " " "		1 00
Mrs. E. M. Gill, " " "		3 00
George Craft, " " "		1 00

AUGUST 5.

BALSAMS.—For the best twelve spikes, eight varieties, to J. B. Moore.	4 00
For the second best, to Samuel Hartwell.	3 00
HAND BOUQUETS. — For the best pair, to J. O'Brien.	3 00
For the second best, to James Nugent.	2 00
CUT FLOWERS. — For the best display, filling 150 bottles, to J. Comley.	5 00
For the second best, to W. K. Wood.	4 00
For the third best, to Hovey & Co..	3 00
For the best collection of fifty named varieties of Annuals and Perennials, to Hovey & Co..	6 00
TABLE DESIGN. — For the best, other than a Basket of Flowers, to Hovey & Co..	3 00
For the second best, to Mrs. S. Joyce.	2 00

Gratuities: —

To Hovey & Co.. for *Monstrosa deliciosa*.	2 00
J. S. Richards, " Gladioli.	4 00
Mrs. E. M. Gill, " Balsams.	1 00
Mrs. S. Joyce, " "	1 00
Mrs. C. N. S. Horner, for Native Flowers.	2 00
E. H. Hitchings, " " "	1 00
E. Shepherd, " Cut "	1 00
John B. Moore, " " "	2 00
E. A. Story, " " "	1 00
James Nugent, " Vase of "	1 00

To Miss A. C. Wheeler,	for Dish of Flowers, . .	$1 00
Mrs. E. M. Gill,	" " " " . . .	1 00
" " "	" stand of Cut Flowers, .	2 00
George Craft,	" " " " . .	1 00

August 12.

Late Phloxes. — For the best ten distinct named varieties, to Francis Parkman, ...	4 00
For the second best, to Hovey & Co., . . .	3 00
Petunias. — For the best collection of double and single, filling 50 bottles, to E. W. Wood, . . .	4 00
For the second best, to James Cartwright, . .	3 00
Cut Flowers. — For the best display, filling 150 bottles, to James Comley, ...	5 00
For the second best, to W. K. Wood, . . .	4 00
For the third best, to Mrs. E. M. Gill, . . .	3 00
For the best collection of fifty named varieties of Greenhouse Flowers, to C. M. Atkinson, . . .	6 00
For the second best, to Hovey & Co., . . .	4 00
Baskets of Flowers.—For the best arranged, to Hovey & Co., ...	3 00
For the second best, to Mrs. A. D. Wood, . .	2 00
Native Ferns.—For the best display of named species and varieties, one bottle of each, to Mrs. C. N. S. Horner, ...	5 00

Gratuities:

To Daniel Duffy,	for *Amaryllis Belladonna*, . . .	5 00
J. S. Richards,	for Gladioli, ...	5 00
C. L. Allen,	" "	1 00
B. G. Smith,	" Phlox, ...	1 00
James Comley,	" Seedling Phlox, ...	2 00
Mrs. S. Joyce,	" Balsams, ...	1 00
W. J. Vass,	" "	1 00
E. H. Hitchings,	for Native Flowers, . . .	2 00
George N. Smith,	" " "	2 00
Mrs. C. N. S. Horner,	" " . . .	2 00
Miss A. C. Wheeler,	for Cut Flowers, . . .	1 00
J. B. Moore,	" " " . . .	1 00
George Craft,	" " " . . .	2 00

To James Nugent, for Cut Flowers,	$1 00
" " " Bouquet,	1 00
Mrs. C. B. Chase, for Dish of Flowers,	1 00

AUGUST 19.

GLADIOLI.—For the best twenty named varieties, to J. S. Richards,	10 00
For the best ten named varieties, to J. B. Moore,	6 00
For the second best, to A. McLaren,	5 00
For the third best, to George Craft,	4 00
For the best display of named or unnamed varieties, to J. S. Richards,	10 00
For the second best, to George Craft,	8 00
For the third best, to Herbert Gleason,	6 00
CUT FLOWERS.—For the best display, filling 150 bottles, to James Comley,	5 00
For the second best, to W. K. Wood,	4 00
For the third best, to Hovey & Co.,	3 00
For the best collection of fifty named varieties of Annuals and Perennials, to Hovey & Co.,	6 00
BOUQUETS.—For the best pair of Parlor Bouquets, to James Nugent,	3 00
For the best pair of Hand Bouquets, to J. O'Brien,	3 00
For the second best, to Hovey & Co.,	2 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Hovey & Co.,	3 00
For the second best, to Mrs. S. Joyce,	2 00

Gratuities:—

To H. E. Smith, for *Amaryllis Smithii*,	1 00
Hovey & Co., for *Ixora*,	1 00
C. M. Atkinson, for *Eryngium platyphyllum*.	1 00
Mrs. E. M. Gill, for *Agapanthus*,	1 00
Miss S. W. Story, for Lilies,	1 00
W. H. Spooner, " "	2 00
Mrs. E. M. Gill, for Balsams,	1 00
Miss A. C. Wheeler, for Dish of Flowers,	1 00
James Nugent, for Vase of Flowers,	1 00
Mrs. A. D. Wood, for Basket of Flowers,	2 00

To Mrs. C. N. S. Horner, for Native Flowers, . .	$2 00
" " " " " " " Ferns, . . .	1 00
E. Shepherd, for Cut Flowers, ...	1 00
W. J. Vass, " " "	3 00
J. B. Moore, " " "	1 00
John Vose, " " "	2 00

AUGUST 26.

ASTERS.—For the best thirty flowers, not less than ten varieties, to C. M. Atkinson, ...	5 00
For the second best, to J. B. Moore, . . .	4 00
For the third best, to J. A. Black, ...	3 00
For the best twenty flowers, not less than six varieties, to James Nugent, ...	3 00
For the second best, to Hovey & Co., . . .	2 00
POMPONS.—For the best sixty blooms, not less than six varieties, in bunches of three of the same variety, to J. B. Moore, ...	4 00
For the second best, to James Nugent, . . .	3 00
CUT FLOWERS.—For the best display, filling 150 bottles, to J. B. Moore, ...	5 00
For the second best, to W. K. Wood, . . .	4 00
For the third best, to James Comley, . . .	3 00
For the best fifty named varieties of Greenhouse Flowers, to Hovey & Co., ...	6 00
For the second best, to C. M. Atkinson, . . .	4 00
BASKET OF FLOWERS.—For the best arranged, to Hovey & Co., ...	3 00
For the second best, to Mrs. A. D. Wood, . .	2 00

Gratuities:—

To W. H. Spooner, for Lilies, ...	2 00
" " " " Gladioli, ...	0
George Craft, " "	4 00
J. S. Richards, " "	4 00
George E. Davenport, for Native Flowers, . .	1 00
A. McLaren, for *Hydrangea paniculata grandiflora*, .	1 00
Hovey & Co., for Asters, ...	1 00
Mrs. S. Joyce, for Dish of Flowers, ...	2 00
Miss A. C. Wheeler, for Dish of Flowers, . .	1 00

To J. B. Moore, for Cut Flowers,	$1 00
Mrs. E. M. Gill, for Cut Flowers,	2 00
W. J. Vass, " " "	2 00
James Nugent, " " "	2 00

SEPTEMBER 2.

LILIES.—For the best display of *Lilium lancifolium*, cut flowers, to W. H. Spooner,	5 00
For the second best, to Hovey & Co.,	4 00
VERBENAS.—For the best collection, filling 50 bottles, to Edmund S. Smith,	4 00
For the second best, to J. O'Brien,	3 00
CUT FLOWERS.—For the best display, filling 150 bottles, to W. K. Wood,	5 00
For the second best, to J. O'Brien,	4 00
For the third best, to J. Comley,	3 00
For the best collection of fifty named varieties of Annuals and Perennials, to Hovey & Co.,	6 00
BASKETS OF FLOWERS.—For the best arranged, to Hovey & Co.,	3 00
For the second best, to Mrs. A. D. Wood,	2 00
NATIVE PLANTS.—For the best display of named species and varieties, to Mrs. C. N. S. Horner,	5 00

Gratuities:—

To A. P. Calder, for *Hydrangea paniculata grandiflora*,	1 00
W. H. Spooner, for Gladioli,	1 00
J. S. Richards, " "	4 00
W. H. Spooner, for Asters,	1 00
E. R. Mudge, " "	1 00
Samuel G. Stone, for Dahlias,	1 00
Miss S. W. Story, for Lilies,	1 00
Mrs. E. M. Gill, for Cut Flowers,	2 00
James Nugent, " " "	1 00
W. J. Vass, " " "	2 00
J. B. Moore, " " "	3 00
Mrs. S. Joyce, " Basket of Flowers,	2 00
Miss A. C. Wheeler, for Dish of Flowers,	1 00

SEPTEMBER 9.

DOUBLE ZINNIAS.—For the best thirty flowers, not less than six varieties, to George Craft,	$4 00
For the second best, to James Nugent,	3 00
CUT FLOWERS.—For the best display, filling 150 bottles, to W. K. Wood,	5 00
For the second best, to J. O'Brien,	4 00
For the third best, to Mrs. E. M. Gill,	3 00
For the best collection of fifty named varieties of Greenhouse Flowers, to Hovey & Co.,	6 00
For the second best, to J. McTear,	4 00
BASKET OF FLOWERS.—For the best arranged, to Hovey & Co.,	3 00
For the second best, to Mrs. A. D. Wood,	2 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Hovey & Co.,	3 00
For the second best, to Mrs. S. Joyce,	2 00

Gratuities:—

To W. H. Spooner, for Lilies,	2 00
Miss S. W. Story, for Lilies,	1 00
E. C. Smith, for Cockscombs,	1 00
J. G. Barker, for Hydrangeas,	2 00
George Craft, for Gladioli and Zinnias,	4 00
J. S. Richards, " "	5 00
Hovey & Co., for Cypripedium,	1 00
Samuel G. Stone, for Dahlias,	2 00
Miss A. C. Wheeler, for Dish of Flowers,	1 00
Mrs. C. B. Chase, " " "	1 00
James Comley, for Cut Flowers,	2 00
" " " " "	1 00
J. B. Moore, " " "	2 00
Hovey & Co., " Azaleas,	3 00

ANNUAL EXHIBITION.

SEPTEMBER 19, 20, 21, AND 22.

GREENHOUSE PLANTS.—For the best twelve greenhouse and stove plants, of different varieties, to F. L. Ames,	$35 00
For the second best, to Hovey & Co.,	30 00

SPECIMEN PLANT.—For the best, not variegated, of a kind for which no special prize is offered, to Hovey & Co.,	$10 00
For the second best, to William Gray, Jr., . .	6 00
SPECIMEN FLOWERING PLANT. — For the best, to Hovey & Co., ...	10 00
For the second best, to Hovey & Co., . . .	6 00
VARIEGATED LEAVED PLANTS. — For the best six varieties, not offered in the collection of greenhouse plants, to Hovey & Co., ...	15 00
For the second best, to William Gray, Jr., . .	10 00
For the best single specimen, not offered in any collection, to William Gray, Jr., ...	5 00
For the second best, to J. B. Moore, . . .	4 00
CALADIUMS.—For the best six varieties, to C. M. Atkinson,	6 00
For the second best, to Hovey & Co., . . .	5 00
FERNS. — For the best nine named varieties, to F. L. Ames, ...	15 00
For the second best, to Hovey & Co., . . .	10 00
For the best six new varieties, to J. Warren Merrill. .	10 00
ADIANTUMS. — For the best six varieties, to Hovey & Co.,	10 00
TREE FERNS. — For the best pair, to J. Warren Merrill,	15 00
DRACÆNAS. — For the best six named varieties, to Hovey & Co., ...	10 00
PALMS. — For the best pair, to William Gray, Jr., . .	10 00
For the second best, to Hovey & Co., . . .	6 00
AGAVES. — For the best six distinct varieties, to Hovey & Co., ...	15 00
For the second best, to E. S. Rand, Jr., . . .	10 00
CACTI. — For the best twenty-five species and varieties, to John C. Hovey, ...	10 00
SUCCULENTS. — For the best collection, (other than Agaves and Cacti), of twenty-five species and varieties, to John C. Hovey, ...	15 00
BEST NEW POT PLANT, it having never before been shown at any exhibition of the Society, to F. L. Ames, the Society's Silver Medal.	
CELOSIA PYRAMIDALIS. — For the best four, to C. M. Atkinson, ...	5 00
GLADIOLI. — For the best display and best kept during the exhibition, of named or unnamed varieties, filling 200 bottles, to George Craft, . . .	10 00

For the second best, to A. McLaren,	$8 00
For the third best, to J. S. Richards,	6 00
DAHLIAS. — For the best twelve named varieties, to S. G. Stone,	6 00
For the best six named varieties, to C. M. Atkinson,	4 00
For the best single flower, to C. M. Atkinson,	2 00
For the second best single flower, to S. G. Stone,	1 00
LILIPUTIAN. — For the best general display, filling 50 bottles, to S. G. Stone,	4 00
PARLOR BOUQUETS. — For the best pair exhibited on Wednesday, to James O'Brien,	6 00
For the second best, to James Nugent,	4 00
HAND BOUQUETS. — For the best, to Mrs. E. M. Gill,	6 00
For the second best, to James O'Brien,	4 00
PARLOR BOUQUETS. — For the best pair exhibited on Thursday, to James Nugent,	6 00
For the second best, to James O'Brien,	4 00
HAND BOUQUETS. — For the best, to Mrs. S. Joyce,	6 00
For the second best, to J. O'Brien,	4 00
CUT FLOWERS. — For the best display and best kept through the exhibition, filling 100 bottles, to W. K. Wood,	18 00
For the second best, to Hovey & Co.,	16 00
For the third best, to Mrs. E. M. Gill,	14 00
For the fourth best, to W. C. Strong,	12 00
For the fifth best, to J. O'Brien,	10 00
For the sixth best, to James Nugent,	8 00
For the seventh best, to A. H. Dunlap,	6 00
BASKET OF FLOWERS. — For the best arranged, on Tuesday, to Hovey & Co.,	5 00
For the second best, to Mrs. S. Joyce,	4 00
For the best arranged, on Thursday, to Mrs. S. Joyce,	5 00
For the second best, to Hovey & Co.,	4 00
RUSTIC STAND. — For the best specimen, not less than three feet in height, to Hovey & Co.,	10 00
For the second best, to W. J. Vass,	8 00
TABLE DESIGN. — For the best, to be arranged without fruit, and not to exceed four feet in height, to Hovey & Co.,	10 00
For the second best, to Mrs. E. M. Gill,	8 00

Hunnewell Premiums.

Evergreen Trees and Shrubs. — For the best display in pots, to W. C. Strong,		$8 00
For the second best, to J. W. Manning,		5 00
Gratuities: —		
To E. S. Rand, Jr., for	*Lycopodium Japonicum.*	1 00
M. H. Merriam, "	*Lapageria alba,*	2 00
W. T. Andrews, "	*Zephyranthes candida.*	1 00
C. M. Atkinson, "	*Dionœa muscipula,*	2 00
E. H. Hitchings, "	*Botrychium ternatum,*	2 00
Hovey & Co., "	*Yucca aloifolia,*	3 00
F. L. Ames, "	collection of Plants,	4 00
W. J. Vass, "	" "	10 00
Wm. Gray, Jr., "	" "	10 00
E. S. Rand, Jr., "	" "	4 00
Hovey & Co., "	" "	10 00
W. T. Andrews, "	" Caladiums,	10 00
J. B. Moore, "	"	4 00
J. Warren Merrill, for	collection of Ferns,	10 00
J. W. Manning, for	Evergreens,	5 00
Hovey & Co., "	"	4 00
Miss S. W. Story, for	Lilies,	2 00
C. T. Smith, "	Cockscombs,	2 00
Samuel G. Stone, "	Dahlias,	2 00
W. H. Spooner, "	Gladioli,	1 00
D. R. Beckford, Jr., "	Native Flowers,	1 00
Mrs. C. N. S. Horner, for "	"	5 00
Mrs. E. M. Gill, for	Cut Flowers,	1 00
C. M. Atkinson, "	" "	1 00
W. C. Strong, "	" "	5 00
George Craft, "	" "	3 00
J. B. Moore, "	" "	2 00
A. H. Dunlap, "	" "	3 00
Miss A. C. Wheeler, for	Dish of Flowers,	1 00
Mrs. S. Joyce, "	" "	1 00
James Nugent, "	Large Bouquets,	6 00
Miss S. W. Story, "	Design,	3 00
D. R. Beckford, Jr., "	Wardian Case,	8 00
W. H. Halliday, "	" "	5 00

To A. Greenlaw, for Wardian Case, ...	$5 00
Carl Deeterich, for " "	3 00
W. H. Halliday " Fern " . .	4 00

SEPTEMBER 30.

Gratuities: —

To E. Shepherd, for Dahlias, ...	1 00
Mrs. C. N. S. Horner, for Native Flowers, . .	2 00
Mrs. S. Joyce, for Basket of " . .	2 00

OCTOBER 7.

TABLE DESIGN. — For the best, other than a Basket of Flowers, to Mrs. S. Joyce, ...	3 00
PARLOR BOUQUETS.—For the best pair, to James Nugent,	4 00
HAND BOUQUETS. — For the best pair, to James O'Brien,	3 00
For the second best, to Mrs. S. Joyce, . . .	2 00

Gratuities: —

To Mrs. S. Joyce, for *Anemone Japonica alba*, . .	1 00
Miss A. C. Wheeler, for Basket of Flowers, . .	1 00
Mrs. A. D. Wood, " " " . .	2 00
John B. Moore, for Cut Flowers, ...	2 00
James Nugent, " " "	1 00
Mrs. C. N. S. Horner, for Native Flowers, . .	2 00
S. G. Stone, for Dahlias, ...	5 00
B. G. Smith, " "	1 00
E. Shepherd, " "	1 00
Hovey & Co., " "	2 00
" " " Plants, ...	2 00

OCTOBER 14.

Gratuities: —

To Mrs. A. D. Wood, for Basket of Flowers, . .	2 00
Mrs. S. Joyce, " " " . . .	2 00
Mrs. E. M. Gill, " Cut Flowers, . . .	1 00
Miss A. C. Wheeler, for Dahlias, ...	1 00
S. G. Stone, " "	2 00
Miss S. W. Story, " Grasses, ...	1 00

October 21.

Gratuities: —

To Mrs. E. M. Gill, for Basket of Flowers,		$2 00
Mrs. S. Joyce,	" " "	2 00
Mrs. C. N. S. Horner, for Native Flowers.		2 00
Miss A. C. Wheeler, for Cut Flowers,		1 00
Miss S. W. Story,	" " "	1 00

October 28.

Gratuities: —

To Mrs. A. D. Wood, for Basket of Flowers.		2 00
Mrs. S. Joyce,	" " "	2 00
D. R. Beckford, Jr., for Dish of Flowers,		1 00
Miss A. C. Wheeler,	" Cut "	1 00
Miss S. W. Story,	" " "	1 00
Mrs. E. M. Gill,	" " "	2 00
Hovey & Co.,	" Orchid.	1 00
H. Weld Fuller,	" *Melocactus communis*,	1 00

November 4.

Gratuities: —

To Miss A. C. Wheeler, for Cut Flowers.		1 00
Miss S. W. Story,	" " "	1 00
Mrs. E. M. Gill,	" " "	2 00
Mrs. S. Joyce,	" Basket of Flowers,	1 00
Hovey & Co., for *Epiphyllum truncatum*,		2 00
Mrs. C. N. S. Horner, for Native Ferns and Mosses,		2 00

CHRYSANTHEMUM SHOW.

November 11.

Chrysanthemums. — For the best six distinct Large Flowered varieties, to Joseph Clark,	$10 00
For the second best, to C. M. Atkinson,	6 00
For the best six distinct named Pompons, to Joseph Clark,	10 00
For the second best, to C. M. Atkinson,	6 00
For the best specimen plant, to Joseph Clark,	5 00
For the second best, to C. M. Atkinson,	3 00

For the best twelve named Large Flowered varieties, Cut Specimens, to C. M. Atkinson, . . .	$3 00
For the second best, to Joseph Clark, . . .	2 00
For the best twelve named Pompon varieties, Cut Specimens, to Joseph Clark, ...	3 00
For the second best, to James Nugent, . . .	2 00
For the best General Display, named or unnamed varieties, Cut Specimens, to Joseph Clark, . .	5 00
For the second best, to E. Shepherd. . . .	4 00
For the third best, to James Nugent, . . .	3 00
Basket of Flowers. — For the best arranged, to Mrs. S. Joyce, ...	3 00
For the second best, to Hovey & Co., . . .	2 00
Hand Bouquets. — For the best pair, to Mrs. E. M. Gill,	3 00
For the second best, to James Nugent, . . .	2 00

Gratuities: —

To C. M. Atkinson, for *Sarracenia Drummondi*, . .	2 00
B. G. Smith, " Chrysanthemums, . . .	2 00
J. B. Moore, " Cut Flowers, ...	2 00
Miss S. W. Story, " " "	2 00
Miss A. C. Wheeler, for Cut Flowers. . . .	1 00
James Comley, " " "	1 00
Mrs. E. M. Gill, " " "	1 00
W. K. Wood, " " "	1 00
Mrs. A. D. Wood, " Dish of Flowers, . .	2 00
Mrs. E. M. Gill, " " " " . . .	1 00
Mrs. L. P. Weston, " Bouquet, ...	1 00

November 18.

Gratuities: —

To C. T. Hubbard, for *Zygopetalum crinitum*, . .	1 00
Miss S. W. Story, for Cut Flowers, ...	1 00
James Comley, " " "	1 00
Mrs. S. Joyce, " " "	1 00
Miss A. C. Wheeler, for Basket of Flowers, . .	1 00
Mrs. A. D. Wood, " " " . . .	2 00
Mrs. E. M. Gill, " " " . . .	1 00
Mrs. L. P. Weston, " " " . . .	1 00
D. R. Beckford, Jr., " " " . . .	1 00

NOVEMBER 25.

Gratuities: —

To James Comley, for Cut Flowers,	$1 00
Mrs. A. D. Wood, for Basket of Flowers,	1 00
D. R. Beckford, Jr., " " " "	1 00
Mrs. S. Joyce, " " " "	1 00

DECEMBER 2.

Gratuities: —

To Mrs. A. D. Wood, for Basket of Flowers,	2 00
Mrs. S. Joyce, " " " "	1 00

DECEMBER 9.

Gratuities: —

To James Comley, for Cut Flowers,	1 00
C. T. Hubbard, for *Cypripedium insigne*,	1 00
Miss S. W. Story, for Vase of Flowers,	1 00
Mrs. A. D. Wood, for Basket of Flowers,	1 00

The following Medals, Certificates of Merit, and Prospective Prizes, have been awarded:

February 12. To John F. Rogers, for Specimen Azalea Criterion, Silver Medal.

February 19. To Francis Putnam, for Seedling Amaryllis, First Class Certificate of Merit.

March 18. To C. S. Sargent, for *Phormium tenax variegatum*, in flower, Silver Medal.

April 15. To John H. Moore, for Seedling Gloxinia, First Class Certificate of Merit.

May 20. To John Cadness, for new Hydrangea, Thomas Hogg, Silver Medal.

June 3. To Hovey & Co., for *Epiphyllum Hoveyi*, First Class Certificate of Merit.

June 10. To E. S. Rand, Jr., for Seedling Rhododendron, Daisy Rand, the Prospective Prize of $40.

June 27. To John Robinson, for a choice collection of Native Ferns, Silver Medal.

July 8. To F. L. Ames, for new and rare Orchids, Silver Medal.

August 5. To Francis Parkman, for *Lilium Parkmanni*, the Prospective Prize of $40.

August 12. To Francis Parkman, for the best Seedling Late Phlox, Silver Medal.

Annual Exhibition. To F. L. Ames, for the best new pot plant, *Cypripedium Sedeni*, Silver Medal.

The amount awarded to each contributor is as follows:

C. L. Allen,	$1 00	A. Greenlaw,	$5 00
F. L. Ames,	54 00	W. H. Halliday,	28 00
F. W. Andrews,	11 00	Samuel Hartwell,	3 00
C. M. Atkinson,	179 00	E. H. Hitchings,	16 00
J. G. Barker,	2 00	Mrs. C. N. S. Horner,	61 00
D. R. Beckford, Jr.,	12 00	Hovey & Co.,	513 00
A. P. Calder,	6 00	J. C. Hovey,	26 00
Miss M. E. Carter	1 00	C. T. Hubbard,	4 00
James Cartwright,	9 00	H. H. Hunnewell,	59 00
J. C. Chaffin,	30 00	Institution for the Blind,	1 00
Mrs. C. B. Chase	3 00	Mrs. S. Joyce,	119 00
Edward B. Clapp,	1 00	Miss A. C. Kenrick,	11 00
Joseph Clark,	68 00	A. S. Lewis,	2 00
M. W. Clark,	1 00	J. W. Manning,	10 00
James Comley,	302 00	A. McLaren,	18 00
George Craft,	41 00	J. McTear,	16 00
James Cruickshanks,	1 00	M. H. Merriam,	2 00
George E. Davenport,	14 00	J. Warren Merrill,	37 00
Jackson Dawson,	2 00	Eddie W. Mitchell,	1 00
Carl Deeterich,	3 00	J. B. Moore,	179 00
Daniel Duffy,	5 00	E. R. Mudge,	1 00
A. H. Dunlap,	9 00	Norton Brothers,	5 00
W. E. Endicott	1 00	James Nugent,	75 00
Miss E. Farrington,	1 00	J. O'Brien,	65 00
L. H. Foster,	8 00	M. C. O'Shea,	1 00
H. W. Fuller,	2 00	Francis Parkman,	103 00
C. B. Gardiner,	11 00	Francis Putnam,	13 00
Mrs. E. M. Gill,	132 00	E. S. Rand, Jr.,	300 00
H. H. Gilson,	3 00	Harry S. Rand,	1 00
H. Gleason,	6 00	J. S. Richards,	63 00
W. Gray, Jr.,	200 00	John Robinson,	6 00
W. Gray, 3d,	4 00	John F. Rogers,	26 00

Waldo O. Ross. . .	$1 00	Miss M. B. Tobey. .	$1 00
C. S. Sargent. . .	2 00	Twombley & Sons. .	1 00
E. Shepherd. . .	18 00	W. J. Vass, . .	26 00
Mrs. Sherman. . .	1 00	John Vose. . .	2 00
Benj. G. Smith. . .	20 00	Mrs. L. P. Weston. .	4 00
Edmund S. Smith. .	7 00	Miss A. C. Wheeler. .	28 00
George N. Smith. .	6 00	J. W. Wilcox. . .	1 00
H. E. Smith, . .	2 00	Marshall P. Wilder. .	48 00
W. H. Spooner. . .	21 00	Mrs. A. D. Wood. .	83 00
Samuel G. Stone. .	23 00	E. W. Wood. . .	4 00
Miss S. W. Story, .	48 00	W. K. Wood. . .	74 00
W. C. Strong. . .	21 00	J. H. Woodford. .	11 00
Miss C. L. Tallant, .	2 00	D. Zirngiebel, . .	2 00
Thomas Tapper, .	1 00		

Amount appropriated, - - -	$3,200 00
" awarded, - - - -	3,023 00
Balance, - - -	$177 00

Amount awarded for Hunnewell Special Prizes,	$183 00
" " " Gray " "	140 00
" " " Comley " "	5 00

REPORT

OF THE

COMMITTEE ON FRUITS.

FOR THE YEAR 1876.

BY HERVEY DAVIS, CHAIRMAN.

As the swift and fleeting hours of time pass, and another fruit season draws to a close, it becomes our duty to examine and report upon the past, present, and future condition and prospects of the supply and demand for fruits in Massachusetts. In relation to the past, we have to acknowledge a great change. In going back but a few years, we notice a marked difference in the supply of strawberries. It is but a short time since our strawberry season lasted only from the 15th of June to the 10th of July; but now, owing to the improved facilities of transportation, our markets are supplied with this very desirable fruit from about the 1st of May until the 10th of July, and at a much less price than formerly. The same rule will apply to almost all kinds of fruits, as regards the increased length of time, and the prices we have to pay.

Besides the strawberry, a very striking instance may be found in the grape. It is but a very few years since, that almost the only varieties of grapes we had were the Isabella and Concord, and those in very limited quantities; but now we are supplied with this fruit, from the South and West, from early in August until late in the season, when California comes in with her abundant crops, and continues the season of this desirable fruit until mid-winter. With this great increase of fruits from the South and West, and the great interest taken in the Eastern States, with their innumerable varieties of the different kinds of fruit now grown, and the equally great interest shown in raising new hybrid and other seedlings, we should have no fear for the present and future supply of all kinds of fruit, covering nearly the entire year, from January to December.

The season of 1876 was void of extremes, in either moisture or dryness, heat or cold; and, owing to this favorable condition of the season, we have been blessed with an abundant crop of almost every kind of fruit, and at very moderate prices, which has contributed much to supply the wants and comforts of all classes of our citizens, the poor as well as the rich, in this year of great depression and want.

Strawberries.—The only exhibitions of forced strawberries were from R. Oldreive, March 4th, and George Cruickshanks, March 25th, and these in very limited quantities. Strawberries grown in frames under glass were exhibited by Charles Garfield, May 27th and June 3d, 10th, and 17th; by Marshall P. Wilder, June 10th. and by C. E. Grant, June 17th. The crop of strawberries was injured in some places by the vines being winter-killed, but not to any great extent. The exhibition of this fruit has been above the average of seasons, but not as good as last year.

The first prize for the best four quarts, at the Rose Show, June 21st, was awarded to John B. Moore, for his seedling, General Sherman. Mr. Moore makes the strawberry a specialty on his farm, and it will be noticed by reference to the list of awards that he has received a large proportion of the prizes for this fruit. We wish to call particular attention to his collection, as it will be seen that he has been interested in raising seedlings, and very successful. Among those raised by him and put upon the market, are the General Sherman, a very large and handsome berry, and of good quality. Caroline, a description of which has been given in a previous report, is also a large and handsome berry; quality first rate, and a very abundant bearer. We have seen it growing in abundance on Mr. Moore's grounds in Concord in 1875 and 1876, and consider it the best and most valuable seedling originated by him. Grace, another of his seedlings, is by some considered the best in quality of any he has raised; but in other respects not as valuable. The Committee having visited Mr. Moore's grounds, in the last strawberry season, found the same order and neatness in his beds, and extending to every part of his farm, as was noticed in a previous visit. These points are worthy of imitation by all who desire to grow small fruits with success.

June 27th, at the Strawberry Show, the first prize for the best four quarts, was awarded to Horace Eaton, for President Wilder, and this was considered one of the handsomest baskets of straw-

berries ever exhibited by any member of the Society. There were other baskets of this variety which were very handsome, as also of other varieties. This exhibition was not as large in quantity as some of previous years, but in the size, beauty, and quality of the fruit, it was quite up to the average of past seasons.

July 1st, E. P. Richardson exhibited a very fine collection of strawberries. July 8th, he received the first prize for late strawberries, for La Constante, and the second prize, for Kentucky. He also exhibited a collection of strawberries on the 15th of July.

Seedlings have been exhibited as follows: July 17th, Moore's seedling No. 26. Large, generally conical, but irregular in form; color deep brilliant scarlet, but coloring somewhat irregularly, the tips of some remaining white; flesh white, tinged with red next the outside; hollow at core; flesh firm, quality good. Nos. 27 and 28 correspond so nearly with No. 26 in size, color, and quality, that any other description is considered unnecessary. The Crescent seedling was shown by H. H. Smith, of West Haven, Conn., June 27th. Large; deep, brilliant, glossy scarlet; obtuse conical or wedge shape, with a suture at the apex; flesh, orange scarlet, solid at centre, pretty soft, of rather harsh acid. A truss of fruit showed a disposition to ripen evenly and bring all to good size. June 24th, N. B. White exhibited trusses of eight varieties of seedlings, containing ripe and green fruit. From their appearance we should judge some might be very prolific, but we cannot say much about the quality, as there were but few ripe berries of each variety.

July 22d, Marshall P. Wilder was awarded the Prospective Prize for the best Seedling Strawberry, after a public trial of three years, for his seedling, President Wilder, for its size, beauty, and quality. This seedling was produced in 1861, and put upon the market in August, 1869. It is considered a valuable acquisition, more particularly by amateur growers for home consumption, as its quality is fully equal to any other variety. By some it is said to be an abundant bearer, and it also succeeds well in frames under glass.

Cherries.—We have nothing new to report upon in the line of cherries. The old varieties have been shown, in about the same amount and by the same persons as for the past few years. C. E. Grant exhibited Elton, May Bigarreau, Black Tartarian and Black Eagle; Isaac P. Langworthy, Knight's Early Black; B. B. Davis, Black Eagle; C. N. Brackett, Black Bigarrreau; Frank M. Gilley and Charles F. Curtis, Downer's Late. All of these were fine specimens.

J. H. Fenno exhibited his seedling, Norfolk, July 15th, and was awarded the Society's Silver Medal. This seedling is considered a valuable acquisition; it is a late variety, and in quality first rate.

Currants. — The season has been favorable for this fruit, and the crop was good. B. G. Smith exhibited fine specimens of Black Naples, Versaillaise, Dana's White, and Cherry; J. H. Fenno, Red Dutch, Cherry, Dana's White, and Versaillaise; and Amos Bates and Mrs. E. M. Gill, Versaillaise. Many other persons showed the same varieties, and most of the fruit was very fine — much superior to that of last year.

Gooseberries. — We have nothing new to report, in relation to this fruit. July 22d, the first prize was awarded for Downing, and the second for Wellington's Glory. August 5th, the Downing received the first prize for the best native variety, and Bang-up the first prize for foreign. All the above fruit was good, and the Bang-up, exhibited by B. G. Smith, which took the first prize for foreign varieties, was an extra fine basket of fruit, and worthy of particular notice.

Raspberries. — The exhibition of this fruit, this season was much below the average. July 8th, the first prize was awarded to B. G. Smith, for Franconia, and the second to J. H. Fenno, for American Black Cap. July 15th, the first prize for the best collection was awarded for Hornet, Saunders, Herstine, Philadelphia, and American Black Cap, and the first prize for the best two quarts of any variety for Herstine. The above named varieties, comprised all shown, no new kinds having been offered.

Blackberries. — We are sorry to be again obliged to make an unfavorable report on this valuable fruit. The small crop is probably owing to the cold winter of 1874–5, which killed many of the canes and injured others. July 22d, the first prize was given to the Dorchester, and also on July 29th, and August 5th and 12th, showing that this old variety maintains its former reputation for hardiness, and for the size and quality of its fruit.

Plums. — We have no improvement to report of this fruit. August 19th, the first premium was awarded to J. H. Fenno, for Washington. August 26th, the first prize for the best collection was given to Amos Bates, and for the best dish of any variety, to the same, for Green Gage. At the Annual Exhibition, September 19th, the first prize for a collection, was awarded to Horace Eaton; and for the best dish to the same, for Reine Claude de Bavay.

NECTARINES. — Of this fruit, the only dish offered was one at the Annual Exhibition, of Rivers' Victoria, grown in the orchard-house, by John Falconer. He was awarded the first prize.

FIGS. — August 19th, the first prize was awarded for Brown Turkey, and the second for Purple Ischia. Figs were also exhibited, August 26th, by J. H. Fenno, and Mrs. S. Joyce.

PEACHES. — Of forced peaches, we have but little to report. May 27th, James Comley exhibited a peach tree in a twelve inch pot, bearing thirty-eight peaches, nearly all well ripened. At the Strawberry Show, June 27th, R. W. Turner exhibited some very fine specimens of George the Fourth and Late Crawford. August 19th, John Falconer made a very fine display of peaches, of orchard-house culture. C. D. Kingman exhibited some very fine Early Crawfords, Arthur W. Felton good specimens of River's Early, and J. L. D. Sullivan a fine dish of Hale's Early. The exhibition of out-door peaches was much inferior to that of last year; none of the premiums for a collection were awarded. The second prize for a single dish was awarded for the Foster peach; the first prize for the best dish of orchard-house culture, to John Falconer, for Lord Palmerston, and the second to John Kelley, for Late Crawford. There have been several new seedlings offered, but none worthy of any particular notice.

APPLES. — The exhibition of this fruit during the season has been very fine — much above the average of past seasons. Almost every year is noted for its superior specimens of some varieties of all kinds of fruit, and this rule applies especially to apples. This season, among early apples, the Sweet Boughs were very fine, and much above the average in size and beauty. The Williams were remarkable for size, beauty, and soundness; it is very seldom we see so many fine dishes of any variety as have been shown of the Williams this year. The Gravenstein is another variety that has been remarkably large, handsome, and sound, and has attracted much attention at all weekly and annual shows. The Garden Royal has also been very fine, and exhibited much more than in former years, and was very welcome, as we consider that it stands in the same position among apples, as the Seckel or Dana's Hovey occupies among Pears. There have been many other varieties shown during the season, that have attracted much attention. February 5th, Benjamin P. Ware, of Marblehead, exhibited a dish of the Pickman Pippin, a very handsome apple, and highly prized for cooking, but

not of value as an eating apple. It commands a good price when well known, for cooking purposes. April 15th, J. H. Fenno exhibited a dish of Hubbardston Nonsuch, which were sound, but considerably shrivelled; the flavor was good for so late in the season. May 13th, B. G. Smith exhibited a very fine dish of Roxbury Russets, in excellent condition. August 12th, very fine Large Yellow Boughs were shown by Warren Heustis, John Fillebrown, B. B. Davis, and others; Williams, by Samuel Hartwell, Asa Clement, and George Hill. September 2d, the prizes for the best of any variety, were awarded as follows: the first for Gravenstein, the second for Foundling, the third for Porter, and the fourth for Garden Royal. September 9th, the first prize for any other variety than those named, was given for Garden Royal, second for Holden Pippin, third for Summer Pippin.

At the Annual Show, there were no prizes offered for collections, as has been the practice in past years, but all prizes were offered for single dishes. In making out the Schedule, the Committee selected all the varieties that were grown to any extent, and offered prizes for thirty-eight different kinds, proportioning the number of prizes to the value of the variety for all purposes according to their best judgment, — to the best and most valuable, four prizes, and to those of the least value, two prizes. The Committee are aware that this was a great change, but believe it was for the best interests of the Society, and also of the exhibitor, and think that it has given general satisfaction. The following is the number of dishes of the different varieties, at the Annual Exhibition:

Alexander,	1	Golden Russet,	1
American Beauty,	1	Gravenstein,	14
Baldwin,	13	Holden Pippin,	7
Blue Pearmain,	4	Hubbardston,	20
Cogswell,	2	Hunt Russet,	7
Danvers Winter Sweet,	6	King of Tompkins County,	7
Duchess of Oldenburg,	3	Ladies' Sweet,	5
Dutch Codlin,	2	Lyscom,	2
Esopus Spitzenburg,	1	Maiden's Blush,	4
Fall Pippin,	1	Minister,	3
Fameuse,	3	Mother,	6
Foundling,	5	Northern Spy,	7
Garden Royal,	1	Orange Sweet,	4

Porter,	11	Sudbury Sweet,	2
Pumpkin Sweet,	3	Twenty Ounce,	1
R. I. Greening,	11	Washington Strawberry,	2
Roxbury Russet,	13	Yellow Bellflower,	3

Dr. Charles C. Hamilton, of Cornwallis, Nova Scotia, a Corresponding Member of the Society, desirous of promoting its interests, forwarded a collection of thirty-two varieties of apples, which were exhibited on the 16th of December. Perhaps the finest specimens were the Broadwell, a sweet apple, of excellent quality, originated in Ohio, which deserves to be tested here. The Baldwins, though not large, were the highest colored we have ever seen. The Gravensteins also were not large, but were handsome and in excellent preservation. This is not the first time that Dr. Hamilton has laid the Society under obligation for a similar favor.

On the day last mentioned, O. B. Hadwen, of Worcester, exhibited several apples more generally grown in Worcester county than in the eastern part of the State, but which appear deserving of more extensive trial, first of which we would mention the Washington Royal or Palmer Greening—a handsome yellow apple of medium size and the highest quality, both for table and cooking. The tree is of vigorous growth and good habit, and bears annual crops. It originated on the farm of Joseph P. Hayward, in Sterling. The Leicester Winter Sweet is of large size, yellow, and fine for table or baking. Baylies' Winter Sweet is of medium size, striped with purplish crimson, and has much saccharine matter. Excel is a Connecticut apple of medium size, somewhat conical in form, skin yellow but nearly covered with bright red; juicy, and of brisk but pleasant subacid flavor. McClellan is of medium size, flattened, striped with red, of mild subacid flavor, and thought by the Committee to be one of the best of the collection. We have several times during the season been indebted to Mr. Hadwen for interesting exhibitions of apples, and we wish that more of the apple growers in central and western Massachusetts, where that fruit flourishes better than on the seacoast, might be induced to follow his example.

August 19th, C. F. Gerry, of Dorchester, exhibited a seedling, which he has named Gerry's Sweeting; medium size, round, slightly pearmain shaped, a little angular in transverse section; skin dull greenish yellow, striped with pinkish red, which, towards the sun, is continuous, excepting that it is dotted with white; juicy, sweet; good to very good. This seedling resembles Sweet Romanite,

described at page 377, of "Downing's Fruits and Fruit Trees of America." September 19th, H. A. Lothrop, of Sharon, exhibited the following named seedlings: No. 1.—Large, greenish yellow, striped with red; a bright red cheek next the sun, not unlike the Hubbardston Nonsuch in its general appearance. No. 2.—Medium size; pearmain shape; bright red; quite a handsome apple. No. 3.—Large, greenish, striped with red; very much like No. 1. No. 4.—Large, greenish yellow; not unlike Gloria Mundi. No. 5.—Small, green, sweet; claimed to be a very valuable variety, owing to its keeping until late in winter or spring, and to be very good for baking. These varieties all appear to be very late, none of them being in condition to test their qualities for eating. They are all said to be chance seedlings, springing up near a cider mill, and from cider apples.

Pears.—The season has been very favorable for this fruit, and the exhibitions during the season have been superior to the average of the last few years. The change in the offers of prizes, from collections to single dishes, as spoken of in apples, has been applied to pears; and we think it a great improvement, as the dishes of each variety are arranged together, and if a person comes to get any information in relation to any particular variety, he can see for himself how it succeeds in Cambridge, Worcester, Concord, Revere, or any other part of the State, and judge what variety will do best in his location. Another reason for the change is that it gives the Committee a better opportunity to judge correctly of the different varieties. As remarked in connection with apples, so also with pears — different seasons suit different varieties. Last year the Beurre Hardy was remarkably large and handsome; this season the Beurre Bosc and Beurre d'Anjou show the most marked increase, in size and beauty, over other varieties.

January 22d, J. H. Fenno exhibited fine dishes of Beurre Langelier, Easter Beurre, and Josephine de Malines; John L. Bird, Winter Nelis, and Charles Bird, extra fine Beurre d'Anjou. March 11th, Aaron D. Capen showed Beurre d'Aremberg, and J. H. Fenno, Josephine de Malines, and on the 18th, Aaron D. Capen, Winter Nelis. April 1st, F. & L. Clapp showed their seedling No. 2. This is a very handsome pear, not first rate in quality, but will be valuable for its beauty and late keeping. April 15th, J. H. Fenno brought very fine Easter Beurres, and on the 22d, F. & L. Clapp their seedling No. 64. The specimens of this

variety were not quite equal to those shown in 1875, but were very handsome, and of better quality than No. 2.

July 29th, Doyenne d'Eté pears were shown by J. H. Fenno, Warren Heustis, Frank M. Gilley, and B. G. Smith. August 5th, Warren Heustis, W. S. Janvrin, and John McClure had fine specimens of Beurre Giffard. August 12th, the first prize for any other variety than Beurre Giffard, was awarded for Suprême de Quimper. August 19th was premium day for Clapp's Favorite; and this was one of the best weekly exhibitions during the year. The season was suited to this variety, and the display, not only on this, but on other days, was remarkably fine. August 26th, being prize day for Bartlett and several other varieties, we had a very fine exhibition. The competition on Bartlett was very spirited, and some of the dishes shown were very large and handsome. The first prize was awarded to John McClure, and the first premium for any other variety than those specified, was given to Hovey & Co., for Omer Pasha. September 2d was another premium day for Bartlett, and the competition was again very large. The first prize was awarded to John McClure; the first prize for any other variety, to B. G. Smith, for Duchesse de Berri, and the second to R. Manning, for Ott. September 9th, fine specimens of Andrews pears were shown by C. N. Brackett, John L. Bird, and C. E. Grant, and of Doyenne Boussock by E. W. Wood, Hovey & Co., and Charles Bird. The first prize for any other variety than these or Flemish Beauty was given for Belle Lucrative.

The display of pears at the Annual Exhibition was not as large as on some former occasions, but we think that, considering the quality of all the fruit on exhibition, it was one of the best, if not the best ever made by this Society. The new rule of offering prizes only for single dishes, is probably one reason for there being so little inferior fruit. The most remarkable pears at this exhibition were the Beurre Bosc and Beurre d'Anjou of W. R. Austin, the former weighing nine pounds, seven and three-quarters ounces. Mr. Austin's Duchesse d'Angoulemes weighed eleven pounds, three and one-half ounces. The Beurre Hardy of C. F. Curtis were very fine, but not so large as some shown last year. There were many other very fine specimens of different varieties; but it would require too much space to mention them all. Premiums were offered for forty different varieties, and the following are the number of dishes shown of each:

Adams,	1	Fulton	7
Andrews,	8	Glout Morceau,	9
Bartlett,	23	Goodale,	5
Belle Lucrative,	22	Howell,	15
Beurre d'Anjou,	26	Lawrence,	11
Beurre Bosc,	26	Louise Bonne of Jersey,	24
Beurre Clairgeau,	11	Marie Louise,	5
Beurre Diel,	9	Merriam,	11
Beurre Gris d'Hiver Nouveau,	8	Mount Vernon,	5
Beurre Hardy,	10	Paradis d'Automne,	8
Beurre Langelier,	11	Pratt,	3
Beurre Superfin,	14	Seckel,	28
Buffum,	9	Sheldon,	23
Caen du France,	4	Souvenir du Congrès,	1
Dana's Hovey,	13	St. Michael Archangel,	9
De Tongres,	9	Swan's Orange,	10
Doyenne Boussock,	13	Urbaniste,	15
Doyenne du Comice,	8	Vicar of Winkfield,	11
Duchesse d'Angouleme,	16	Winter Nelis,	12
Flemish Beauty,	6		

At the show on the 7th of October, the varieties worthy of particular notice were the same as at the Annual Exhibition. The dish of Beurre Bosc of S. C. Perkins, we think was the largest and handsomest of this variety ever on exhibition. They were very uniform in shape and size, and of fine russet color, and we believe we are justified in saying it was a perfect dish of pears. The weight was ten pounds and two ounces. The Beurre Boscs of W. R. Austin were also very handsome, and the Beurre Diels of T. M. Davis were very good, as were most of the pears at this exhibition.

October 28th, F. & L. Clapp exhibited their seedling, Frederick Clapp, which has been mentioned several times in previous reports as No. 22. It still maintains its reputation for its quality, which is first rate. The specimens were not quite as large as some shown two years ago, but were very good. Messrs. Clapp also exhibited No. 17, or Nicholas, which is likewise a very fine pear. At the exhibition of November 11th, the most worthy of note were a very fine dish of Beurre d'Anjou from W. R. Austin, Dana's Hovey from Hovey & Co., Lawrence from J. H. Fenno, and Winter Nelis from John L. Bird.

Through the kindness of Marshall P. Wilder we were favored

with an opportunity to test two seedlings raised by B. S. Fox of San Jose, Cal., some of whose seedlings were noticed in our last report. The Wilder is large, oblong ovate pyriform; dull, greenish yellow, with greenish dots and tracings of russet; very sweet and rich. Barry is larger than the preceding, irregular oblong pyriform, resembling an obtuse Vicar of Winkfield, with a suture, and the eye towards one side, as often found in that variety; skin orange yellow, nearly covered with russet in large patches and rich tracings; flesh exceedingly melting and juicy and very sweet and rich, but without high flavor. Both of these varieties were tested the latter part of December. It is noticed that our finest pears when cultivated in California lose the flavor which distinguishes them here, but gain in sweetness, and it will be of much interest to ascertain whether these very sweet varieties, of California origin, will acquire flavor when grown here.

Native Grapes.—The season has been very favorable for this fruit, and the exhibitions have been very good. September 2d, good specimens of Moore's Early, Israella, and Hartford Prolific were shown. The first prize was awarded for Moore's Early. September 9th, Moore's Early, Norwood, Norfolk Muscat, and Delaware, were the four varieties receiving the prizes, and in the order named.

At the Annual Show nearly all of the premiums were awarded, and most of the fruit was above the average of the last few years. The dish most worthy of special notice, was the Concord shown by Nathan Blanchard. The bunches were very large, well shouldered; berries of good size, well ripened, and covered with a heavy bloom. The Committee unanimously, and with much pleasure, awarded to this dish the first prize for the best Concord. At this exhibition the first prize for "any other variety" was awarded for Moore's Early. The exhibition of late varieties, on the 7th of October, was very good—much better than the previous year. On this day, Nathan Blanchard again exhibited some of his extra fine Concords, and received the first prize; the six bunches on this day weighed six pounds and four ounces, and were equal in all respects to those shown at the Annual Exhibition. Mr. Blanchard said that last year he picked from twenty-five to thirty pounds from one vine, and that weight in twenty bunches; but this season the bunches were smaller in consequence of the early freeze, and consequent unripeness of the wood and buds, of the autumn of 1875. The bunches

that we have described above, he calls small bunches. We hope to have the pleasure next season of reporting on some of his large bunches.

The most remarkable collection of seedlings ever shown at any of the exhibitions of this Society, was by James H. Ricketts, of Newburgh, N. Y., at the Annual Exhibition. It consisted of sixty-five varieties, of different colors, that would rank from good to very good, and quite a number that must be called first rate, in quality. The most remarkable thing connected with this collection, and the most difficult to be explained, was that many of the varieties are from seed of the Clinton, which is a small berry, and generally makes but a small bunch, yet most of these seedlings have large bunches and berries. It is true that they are all hybrids, and the parentage on the opposite side might have been from larger fruit. The Committee tested nearly all of the different varieties, and made notes of most of them, as to quality, color, and size of bunch and berry, which it may at some time be thought best to publish, but they desire at present to be cautious, and not to mislead the public in relation to this fine collection. The probabilities are that most of the varieties would not do as well with us as where they were raised, and Mr. Ricketts concurs in this opinion; but it is to be hoped that some of them may prove hardy and suited to our climate.

N. B. White, exhibited the following named varieties of seedlings: August Giant. — Small bunch, large berry, thick skin, hard pulp, quality fair. Norfolk Muscat. — Medium sized bunch and berry; chestnut color; flavor of the Frontignan, quality good. Black Madeira and Amber Queen have been spoken of in previous reports. No. 6.—Good sized bunch and berry, of fair quality; exhibited October 7th.

September 2d, E. W. Bull had in his collection of seedlings, the following: No. 51. — Large sized bunch and berry, color black. No. 4. — Good sized bunch and berry; color black. Rosalie has been described in previous reports. Nos. 1 and 3 were both black, with good sized bunch and berry. No. 27. — Medium sized bunch and berry. None of these were ripe enough to give an opinion as to quality.

October 7th, J. B. Moore exhibited his Seedling No. 31, a white grape, with medium sized bunch and berry, and quality first rate. It has been spoken of in previous reports with much favor, and we have no reason to change our first impressions. We think it may prove a valuable variety.

Foreign Grapes. — We regret very much not being able to report such bunches of Black Hamburg and other varieties at our exhibitions, as have been shown in England. We have read of bunches weighing twenty-five pounds or more, and here, for the last two years we have offered a premium for the largest bunch, not less than five pounds in weight, and have not had an opportunity to award it. At the Annual Exhibition, the display was as good as the average of the last few years. C. M. Atkinson had in his collection, some very fine bunches. E. H. Luke also had a fine collection of forced varieties, and his fruit was well ripened, and the bunches were very handsome but not large. E. W. Wood, and B. G. Smith's collections contained some very fine fruit. E. W. Wood received the special premium offered by Peter Smith, for the largest and handsomest bunch of black grapes, for Black Hamburg, and for the largest and handsomest white grape, for Golden Hamburg.

Oranges, etc.—January 29th, superior oranges were exhibited by E. R. Chadwick, of San Mateo, Putnam County, Florida. This fruit was raised on trees of seven years' growth, which came into bearing the sixth year. The yield of two hundred and fifty trees, the sixth year, was twenty-three barrels; the seventh year, one hundred and fifteen barrels. The weight of twelve oranges was six and a half pounds. March 4th, C. M. Atkinson exhibited oranges and lemons. March 25th, John Cummings showed very good specimens of bananas, well ripened, and of good flavor. This is the first fruit ever shown, by any member of this Society, that was grown in this State. C. D. Kingman exhibited oranges on the same day. June 3d, J. Fisk Allen showed a very handsome dish of oranges, part of which were grown on a tree that has been in bearing forty years.

By invitation of Joseph H. Fenno, the Committee visited his grounds twice during the season. On the first visit, June 14th, his orchard was found in good order, everything about it being neat and well cared for; the fruit was well set, the trees were all healthy and in fine condition. One particular feature was, his keeping the trees well headed in. The orchard contains about three acres; the trees are set in rows, thirty feet apart, and fifteen feet in the rows. Mr. Fenno has a heavy clay sub-soil, well underdrained. He said he never used any manure or fertilizer, excepting beach sand; and thought that by this method he got less growth of wood, and more and better fruit. Your Committee could hardly

agree with him on this point, but believed that the trees would be much benefited and improved in their thriftiness, and in the size and quantity of fruit, if he should use a liberal amount of manure. On their second visit, the last of August, the Committee found the trees well loaded with fine fruit, and many of the varieties ripe, giving them an opportunity of testing them, which they did not refuse. The grounds on this visit, as well as on the first one, were in fine condition, free from weeds, and in first-rate order. Besides tree fruits, Mr. Fenno raises many small fruits with success, such as currants, strawberries, raspberries, and gooseberries; they were all in fine order.

The Fruit Committee wish to express their thanks to Peter Smith for his liberal donation of fifty dollars, for premiums, to be awarded for fruits, flowers, and vegetables. The amount of twenty dollars was allotted to this Committee, which was all awarded for objects of merit.

At the Annual Exhibition, the number of dishes of Pears exhibited was	565
Number of dishes of Apples, . . .	258
" " Foreign Grapes, . .	44
" " Native " . .	79
Rickett's Seedling Grapes, ...	65

Making in all, 1,011 dishes, of all varieties of fruit.

Premiums and Gratuities have been awarded to one hundred and fifty-three different persons. Last year the number was one hundred and forty. The annexed list of awards, shows the amount of prizes to be, $1,473; gratuities, $527; total, $2,000; balance unexpended, $100. Included in the above mentioned amount of premiums is the Prospective Prize of $50, awarded to Marshall P. Wilder, for his Seedling Strawberry, President Wilder.

All of which is respectfully submitted.

HERVEY DAVIS,
P. B. HOVEY,
BENJ. G. SMITH,
JOHN B. MOORE,
E. W. WOOD,
} *Fruit Committee.*

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

January 22.

Winter Pears. — For the best Beurre Langelier, to J. H. Fenno,	$2 00
For the best Easter Beurre, to J. H. Fenno,	2 00
For the best Josephine de Malines, to J. H. Fenno,	2 00
For the best Vicar of Winkfield, to J. L. Bird,	2 00
For the second best, to J. H. Fenno,	1 00
For the best Winter Nelis, to J. L. Bird,	2 00
For the second best, to C. E. Grant,	1 00
For the best cooking pears of any variety, to J. H. Fenno, for Uvedale's St. Germain,	2 00
For the second best, to C. E. Grant, for Catillac,	1 00

Gratuities:—

To J. H. Fenno, for collection of Apples,	3 00
Charles Bird, for very fine Beurre d'Anjou Pears,	3 00
J. H. Fenno, for collection of Pears,	3 00
C. E. Grant, " " " "	3 00

January 29.

Gratuity: —

To E. R. Chadwick, San Mateo, Florida, for superior Oranges,	3 00

February 5.

Gratuity: —

To Benjamin P. Ware, for Pickman Pippin Apples,	2 00

March 4.

Gratuities:—

To R. Oldreive, for Strawberries,	1 00
C. M. Atkinson, for Lemons and Oranges,	2 00

MARCH 11.

Gratuities: —

To Aaron D. Capen, for Beurre d'Aremberg Pears,	$2 00
Joseph H. Fenno, for Josephine de Malines Pears,	2 00

MARCH 18.

Gratuity: —

To Aaron D. Capen, for Winter Nelis Pears,	1 00

MARCH 25.

Gratuities: —

To John Cummings, for Bananas,	3 00
C. D. Kingman, for Oranges,	2 00
George Cruickshanks, for Strawberries,	1 00
Enoch Pillsbury, for Roxbury Russet Apples,	1 00

APRIL 1.

Gratuity: —

To F. & L. Clapp, for Seedling Pear, No. 2,	3 00

APRIL 15.

Gratuity: —

To J. H. Fenno, for Pears and Apples,	3 00

APRIL 22.

Gratuity: —

To F. & L. Clapp, for Seedling Pear, No. 64,	3 00

MAY 13.

Gratuity: —

To B. G. Smith, for very fine Roxbury Russet Apples,	1 00

MAY 27.

Gratuities: —

To Charles Garfield, for Strawberries,	1 00
James Comley, for Peach Tree in twelve-inch pot, with thirty-eight Peaches,	5 00

June 3.

Strawberries. — Third prize, for a quart grown in frames under glass, to Charles Garfield, ...	$3 00
Gratuity: —	
To John Fisk Allen, for a very handsome dish of Oranges,	5 00

June 10.

Gratuities: —	
To Marshall P. Wilder, for President Wilder Strawberries, ...	2 00
Charles Garfield, for Triomphe de Gand Strawberries,	3 00

June 17.

Gratuities: —	
To John B. Moore, for Jenny Lind Strawberries, . .	3 00
B. G. Smith, " " " " . .	2 00
Joseph H. Fenno, for Brighton Pine Strawberries, .	2 00
Charles Garfield, for Triomphe de Gand Strawberries,	3 00
C. E. Grant, " " " " .	2 00

ROSE SHOW.

June 21.

Early Strawberries. — For the best four quarts, to John B. Moore, for Gen. Sherman, ...	$8 00
For the second best, to Charles Garfield, for Triomphe de Gand, ...	6 00
For the third best, to John B. Moore, for Grace, .	4 00
For the best two quarts, to William C. Child, for Jucunda, ...	4 00
For the second best, to J. B. Moore, for Hovey's Seedling, ...	3 00
For the third best, to Hovey & Co., for Champion,	2 00
Gratuities: —	
To James Comley, for Peaches, ...	3 00
T. W. Walker, for Figs, ...	2 00
B. G. Smith, for Strawberries, ...	2 00
J. B. Moore, for Seedling Strawberries, ...	3 00

JUNE 24.

Gratuities: —

To Charles Garfield, for Strawberries, ...	$2 00
Benj. G. Smith, " "	4 00
C. E. Grant, " "	1 00

STRAWBERRY SHOW.

JUNE 27.

STRAWBERRIES. — For the best four quarts, to Horace Eaton, for President Wilder, ...	$15 00
For the second best, to John B. Moore, for Caroline,	10 00
For the third best, to John B. Moore, for President Wilder, ...	5 00
For the best two quarts of Agriculturist, to H. C. Bowers, ...	4 00
For the best Caroline, to John B. Moore, . . .	4 00
For the best Champion, to John C. Park, . . .	3 00
For the second best, to Hovey & Co., . . .	2 00
For the best Charles Downing, to Warren Heustis, .	3 00
For the second best, to Aaron D. Capen, . .	2 00
For the best Col. Cheney, to Warren Heustis, . .	4 00
For the best Hovey's Seedling, to John B. Moore, .	4 00
For the second best, to Hovey & Co., . . .	3 00
For the third best, to B. G. Smith, . . .	2 00
For the best Jucunda, to Charles W. Shepard, . .	4 00
For the second best, to Charles Garfield, . .	3 00
For the third best, to B. G. Smith, ...	2 00
For the best Lady of the Lake, to John B. Moore, .	3 00
For the second best, to B. G. Smith, . . .	00
For the best Late Prolific, to John B. Moore, . .	3 00
For the second best, to Hovey & Co., . . .	2 00
For the best President Wilder, to George N. Noyes, .	4 00
For the second best, to John B. Moore, . . .	3 00
For the third best, to Marshall P. Wilder, . .	2 00
For the best Seth Boyden, to John C. Park, . .	3 00
For the second best, to John B. Moore, . . .	2 00
For the best Wilson, to G. W. Pierce, . . .	4 00

CHERRIES. — For the best four varieties, to C. E. Grant, for Elton, Napoleon Bigarreau, Black Tartarian and Black Eagle, ...	$6 00
For the best two quarts, to Isaac P. Langworthy, for Knight's Early Black, ...	4 00
For the second best, to C. E. Grant, for Black Tartarian, ...	3 00
For the third best, to Benjamin B. Davis, for Black Eagle, ...	2 00
PEACHES. — For the best twelve specimens, to R. W. Turner, for George the Fourth, ...	8 00
For the second best, to R. W. Turner, for Crawford's Late, ...	6 00
Gratuities: —	
To Frank M. Gilley, for collection of Cherries, . .	2 00
Benj. B. Davis, for Elton Cherries, ...	1 00
Horace Eaton, for Monarch of the West Strawberries,	1 00
H. H. Smith, for Crescent Seedling Strawberries. .	2 00
Wilbur F. Newhall, for Jucunda Strawberries, . .	2 00
J. R. Fisher, for Kentucky Strawberries, ...	1 00
G. W. Pierce, for collection of Strawberries, . .	4 00
Daniel Weston, for Seedling Strawberries, . .	1 00
John B. Moore, for collection of Seedling Strawberries.	5 00
N. B. White, " " " " .	2 00

JULY 1.

Gratuities: —	
To E. P. Richardson, for collection of Strawberries, .	3 00
John B. Moore, for a very fine collection of Strawberries, ...	10 00
George N. Noyes, for Strawberries, ...	1 00
G. W. Pierce, for Cherries, ...	2 00
C. E. Grant, for Black Eagle Cherries, ...	2 00

JULY 8.

CHERRIES. — For the best two quarts, to C. N. Brackett, for Black Bigarreau, ...	4 00
For the second best, to Frank M. Gilley, for Downer's Late, ...	3 00
For the third best, to C. F. Curtis, for Downer's Late,	2 00

RASPBERRIES. — For the best two quarts, to B. G. Smith, for Franconia,	$4 00
For the second best, to J. H. Fenno, for American Black Cap,	3 00
For the third best, to B. G. Smith, for American White,	2 00
STRAWBERRIES. — For the best two quarts, to E. P. Richardson, for La Constante,	4 00
For the second best, to E. P. Richardson, for Kentucky,	3 00
For the third best, to John B. Moore, for Belle,	2 00

Gratuities: —

To William C. Child, for collection,	1 00
C. E. Grant, for Currants and Cherries,	3 00
Frank M. Gilley, for Cherries,	1 00
W. K. Wood, for Currants,	3 00
J. H. Fenno, " "	2 00
B. G. Smith, " "	3 00
G. M. Mellen, " "	1 00
Mrs. E. M. Gill, for Grapes and Raspberries,	3 00
Benj. B. Davis, for Gooseberries,	2 00

JULY 15.

CURRANTS. — For the best four quarts of Red, to Amos Bates, for La Versaillaise,	4 00
For the second best, to B. G. Smith, for La Versaillaise,	3 00
For the third best, to C. M. Atkinson, for La Versaillaise,	2 00
For the best four quarts of White, to J. H. Fenno, for Dana's White,	3 00
For the second best, to Frederick Gould, for Dana's White,	2 00
RASPBERRIES. — For the best collection, to Joseph H. Fenno, for Hornet, Saunders, Herstine, Philadelphia, and American Black,	5 00
For the second best, to John B. Moore, for Hornet, Herstine, Clarke, and Saunders,	3 00

For the best two quarts, to Joseph H. Fenno, for Herstine, ...	$4 00
For the second best, to John B. Moore, for Hornet,	3 00
For the third best, to John B. Moore, for Saunders,	2 00
Gratuities: —	
To Charles Garfield, for collection, ...	2 00
Joseph H. Fenno, " "	2 00
Edward M. Mitchell, for Currants, ...	1 00
John Irvin, " "	1 00
George W. Pierce, " "	1 00
James Nugent, " "	1 00
Amos Bates, " "	1 00
B. G. Smith, " "	1 00
D. B. Flint, for Currants and Raspberries, . .	2 00
E. P. Richardson, for Strawberries and Raspberries, .	2 00
Robert Manning, for Cherries, ...	1 00

JULY 22.

CURRANTS.—For the best collection, to B. G. Smith, for Black Naples, Versaillaise, Dana's New White, and Cherry, ...	5 00
For the second best, to J. H. Fenno, for Red Dutch, Cherry, Dana's White and Versaillaise, . .	3 00
For the best two quarts, to Amos Bates, for Versaillaise,	4 00
For the second best, to B. G. Smith, for Versaillaise,	3 00
For the third best, to Mrs. E. M. Gill, for Versaillaise, ...	2 00
BLACKBERRIES. — For the best two quarts, to Benjamin B. Davis, for Dorchester, ...	4 00
GOOSEBERRIES. — For the best two quarts, to Horace Eaton, for Downing, ...	4 00
For the second best, to B. G. Smith, for Wellington's Glory, ...	3 00
For the third best, to B. G. Smith, for Smith's Seedling, ...	2 00
Gratuities: —	
To Mrs. E. M. Gill, for collection, ...	2 00
Joseph H. Fenno, " "	3 00
John B. Moore, " "	3 00

JULY 29.

BLACKBERRIES.—For the best two quarts, to James Nugent, for Dorchester,	$3 00
For the second best, to Benj. B. Davis, for Dorchester,	2 00
PEARS.—For the best Doyenne d' Eté, to Joseph H. Fenno,	4 00
For the second best, to Warren Heustis	3 00
For the third best, to Frank M. Gilley,	2 00
For the fourth best, to Benj. G. Smith,	1 00

Gratuities:—

To Charles Garfield, for Gooseberries and Blackberries,	2 00
H. M. Wiswall, for Blackberries,	1 00
G. F. Waters, " "	1 00
Benj. G. Smith, for Gooseberries,	1 00
Joseph H. Fenno, for Apples, Pears, and Raspberries,	2 00
Benj. B. Davis, for Large Yellow Bough Apples,	1 00
N. B. White, for Red Astrachan Apples,	1 00
C. N. Brackett, for collection of Apples (July Pearmain, Summer Rose, and Red Astrachan),	2 00
E. W. Wood, for Apples,	1 00
A. S. M'Intosh, for Doyenne d' Eté Pears,	1 00
Mrs. E. M. Gill, for collection,	2 00

AUGUST 5.

PEARS.—For the best Beurre Giffard, to Warren Heustis,	3 00
For the second best, to W. S. Janvrin,	2 00
For the third best, to John McClure,	1 00
For the best Bloodgood, to T. M. Davis,	3 00
For the second best, to Asa Clement,	2 00
For the best Doyenne d' Eté, to Joseph H. Fenno,	3 00
For the best Madeleine, to J. S. Richards,	2 00
For the second best, to Joseph H. Fenno,	1 00
APPLES.—For the best Large Yellow Bough, to B. B. Davis,	3 00
For the second best, to Warren Heustis,	2 00
For the best Williams, to Samuel Hartwell,	3 00
For the second best, to Asa Clement,	2 00

BLACKBERRIES.—For the best, to James Nugent, for Dorchester,	$4 00
For the second best, to Josiah Crosby, for Kittatinny,	3 00
For the third best, to G. F. Waters, for Kittatinny,	2 00
For the fourth best, to C. Garfield, for Kittatinny,	1 00
GOOSEBERRIES.—For the best two quarts of Native, to B. G. Smith, for Downing,	3 00
For the second best, to Joseph H. Fenno, for Houghton's Seedling,	2 00
For the best two quarts of Foreign, to B. G. Smith, for Bang-up,	3 00
For the second best, to C. Garfield, for Crown Bob,	2 00

Gratuities:—

To N. B. White, for Apples,	2 00
Frank M. Gilley, for Apples,	1 00
Edwin Fletcher, for collection of Apples,	1 00
Samuel Hartwell, for Red Astrachan Apples,	1 00
James Comley, " " " "	1 00
Asa Clement, " Early Harvest Apples,	1 00
John B. Moore, for Apples and Raspberries,	2 00
C. N. Brackett, " " " Pears,	1 00
H. M. Wiswall, " Large Yellow Bough Apples and Blackberries,	2 00
G. N. Noyes, for Apples, Gooseberries, and Blackberries,	2 00
Charles Bird, for Beurre Giffard Pears,	1 00
Benj. G. Smith, for Pears,	1 00
Mrs. E. M. Gill, for Gooseberries,	1 00
Amos Bates, for collection,	2 00

AUGUST 12.

APPLES.—For the best Early Harvest, to J. H. Fenno,	3 00
For the second best, to Asa Clement,	2 00
For the best Large Yellow Bough, to Warren Heustis,	4 00
For the second best, to John Fillebrown,	2 00
For the third best, to Benj. B. Davis,	1 00
For the best Red Astrachan, to Warren Heustis,	3 00
For the second best, to Edwin Fletcher,	2 00
For the third best, to Frank M. Gilley,	1 00

For the best Williams, to Samuel Hartwell, . .	$3 00
For the second best, to Asa Clement, . . .	2 00
For the third best, to George Hill, ...	1 00
For the best of any other variety, to Joseph H. Fenno, for American Summer Pearmain, . . .	3 00
For the second best, to Asa Clement, for Early Joe,	2 00
For the third best, to T. M. Davis, for Summer Harvey, ...	1 00
PEARS.—For the best Beurre Giffard, to Charles Bird, .	3 00
For the second best, to Warren Heustis, . . .	2 00
For the third best, to W. S. Janvrin, . . .	1 00
For the best of any other variety, to Hovey & Co., for Suprême de Quimper, ...	3 00
For the second best, to J. McClure, for Osband's Summer, ...	2 00
For the third best, to Hovey & Co., for Manning's Elizabeth, ...	1 00
BLACKBERRIES.—For the best, to James Nugent, for Dorchester, ...	4 00
For the second best, to Charles Garfield, for Kittatinny, ...	3 00

Gratuities:—

To Edwin Fletcher, for Williams Apples, . . .	1 00
Lewis Slack, for Large Yellow Bough Apples, . .	1 00
N. B. White, for Red Astrachan Apples, . . .	1 00
C. N. Brackett, for Williams and River Apples, .	1 00
G. N. Noyes, for collection of Apples, . . .	1 00
Joseph H. Fenno, for Apples, ...	1 00
John B. Moore, for collection of Apples and Raspberries, ...	2 00
J. T. Foster, for Apples and Peaches, . . .	1 00
Charles Bird, for Beurre Giffard Pears, . . .	1 00
J. McClure, " " " " . . .	1 00
Mrs. E. M. Gill, for Foreign Grapes and Pears, .	2 00
C. D. Kingman, for Foreign Grapes and Peaches, .	3 00
Mrs. Benjamin Fobes, for Figs, ...	1 00
Charles Garfield, for Franconia Raspberries, . .	1 00

AUGUST 19.

PLUMS.—For the best dish, to Joseph H. Fenno, for Washington,	$3 00
For the second best, to Amos Bates, for Green Gage,	2 00
For the third best, to Amos Bates, for Smith's Orleans,	1 00
PEARS.—For the best Clapp's Favorite, to F. & L. Clapp,	4 00
For the second best, to Joseph H. Fenno,	3 00
For the third best, to John Fillebrown,	2 00
For the fourth best, to Horace Eaton,	1 00
For the best of any other variety, to Charles Bird, for Dearborn's Seedling,	4 00
For the second best, to C. N. Brackett, for Brandywine,	3 00
For the third best, to Hovey & Co., for Brandywine,	2 00
For the fourth best, to J. H. Fenno, for Rostiezer,	1 00
PEACHES.—For the best of cold house or pot culture, to C. D. Kingman, for Early Crawford,	5 00
For the second best, to John Falconer, for Rivers' Early,	4 00
For the third best, to Arthur W. Felton, for Rivers' Early,	3 00
FIGS.—For the best, to Mrs. Benjamin Fobes, for Brown Turkey,	3 00
For the second best, to T. W. Walker, for Purple Ischia,	2 00

Gratuities:—

To C. F. Gerry, for new Seedling Apple, Gerry's Sweeting,	1 00
N. B. White, for Red Astrachan Apples,	1 00
Walter Russell, for Williams Apples,	1 00
Warren Heustis, " " "	1 00
John Fillebrown, " " "	1 00
John Cummings, " " "	1 00
Edwin Fletcher, for collection of Apples,	2 00
Samuel Hartwell " " "	2 00
Joseph H. Fenno, for Apples,	1 00
Joseph B. Eaton, " "	1 00

To John B. Moore, for Apples and Pears, . . .	$2 00
C. N. Brackett, " " "	3 00
D. B. Flint, " " "	1 00
Warren Heustis, for Clapp's Favorite Pears. . .	1 00
C. F. Curtis, " " " " . .	1 00
J. McClure, for Pears, ...	1 00
C. E. Grant, " "	1 00
J. L. D. Sullivan, for Hale's Early Peaches. . .	2 00
John Falconer, for Peaches, Pears, and Plums. . .	5 00
C. D. Kingman, for Foreign Grapes, . . .	3 00
John B. Moore, for Moore's Early Grapes, . .	2 00
James Nugent, for Dorchester Blackberries and Pears,	1 00

August 26.

Pears.—For the best Bartlett, to John McClure, . .	4 00
For the second best, to Charles F. Curtis. . .	3 00
For the third best, to Horace Eaton, . . .	2 00
For the fourth best, to Hovey & Co., . . .	1 00
For the best Manning's Elizabeth, to Joseph H. Fenno,	3 00
For the second best, to Hovey & Co., . . .	2 00
For the best Pinneo, or Boston, to Hovey & Co., .	3 00
For the second best, to J. H. Fenno. . . .	2 00
For the best Rostiezer, to M. W. Chadbourne. . .	3 00
For the second best, to G. M. Mellen, . . .	2 00
For the third best, to Joseph H. Fenno. . . .	1 00
For the best Tyson, to A. S. M'Intosh. . . .	3 00
For the second best, to Charles Bird, . . .	2 00
For the third best, to Joseph H. Fenno, . . .	1 00
For the best of any other variety, to Hovey & Co., for Omer Pasha, ...	3 00
For the second best, to John Cummings, for Brandywine, ...	2 00
For the third best, to Hovey & Co., for Sterling. .	1 00
Plums.—For the best collection, to Amos Bates. . .	4 00
For the second best, to Horace Eaton, . . .	3 00
For the best dish, to Amos Bates, for Green Gage, .	3 00
For the second best, to H. M. Wiswall, for Bradshaw, ...	2 00
For the third best, to Amos Bates, for Smith's Orleans.	1 00

PEACHES.—For the best dish of Peaches, to J. A. J. Wilcox, for Seedling,	$4 00
For the second best, to J. T. Foster, for Laura,	3 00
Gratuities:—	
To Mrs. E. M. Gill, for Clapp's Favorite Pears,	1 00
J. McClure, " " " "	1 00
F. & L. Clapp, " " " "	1 00
Charles Bird, " " " "	1 00
John Fillebrown, " " " "	1 00
Mrs. S. Joyce, for Pears and Figs,	1 00
E. W. Wood, for Pears and Apples,	1 00
John Cummings, for Apples and Pears,	3 00
C. N. Brackett " " "	1 00
George Hill, for Williams Apples,	1 00
O. B. Hadwen, for Duchess of Oldenburg Apples,	1 00
Joseph H. Fenno, for Apples and Figs,	2 00
Edwin Fletcher, for collection of Apples,	2 00
Samuel Hartwell " " "	1 00
George Craft, for collection of Crab Apples,	1 00
C. D. Kingman, for Grapes and Peaches,	2 00

SEPTEMBER 2.

APPLES.—For the best of any variety, to Samuel Hartwell, for Gravenstein,	4 00
For the second best, to Edwin Fletcher, for Foundling,	3 00
For the third best, to John Cummings, for Porter,	2 00
For the fourth best, to Edwin Fletcher, for Garden Royal,	1 00
PEARS.—For the best Bartlett, to J. McClure,	4 00
For the second best, to W. S. Janvrin,	3 00
For the third best, to Hovey & Co.,	2 00
For the fourth best, to Charles Bird,	1 00
For the best of any other variety, to Benjamin G. Smith, for Duchesse de Berri,	4 00
For the second best, to R. Manning, for Ott,	3 00
For the third best, to Hovey & Co., for Wheeler,	2 00
For the fourth best, to Hovey & Co., for Hannas,	1 00
NATIVE GRAPES.—For the best of any variety, to John B. Moore, for Moore's Early,	4 00

For the second best, to John B. Moore, for Hartford Prolific,	$3 00
For the third best, to Eben Snow, for Israella,	2 00
For the fourth best, to Eben Snow, for Hartford Prolific,	1 00
Gratuities: —	
To Edwin Fletcher, for Apples,	1 00
M. W. Chadbourne, for Apples and Pears,	1 00
Warren Heustis, " " "	1 00
John Cummings, for collection of Apples and Pears,	3 00
G. N. Noyes, " " " "	1 00
C. N. Brackett, " " " "	1 00
O. B. Hadwen, " Pears and Apples,	2 00
J. S. Richards, " collection of Pears,	1 00
C. E. Grant, for Pears and Foreign Grapes,	1 00
George W. Stevens, for Crawford's Early Peaches,	2 00
H. W. Wilson, for Stump the World Peaches,	1 00
B. G. Smith, for collection,	1 00
C. D. Kingman, for Peaches and Foreign Grapes,	3 00

SEPTEMBER 9.

APPLES. — For the best Foundling, to Samuel Hartwell,	3 00
For the second best, to Edwin Fletcher,	2 00
For the third best, to Asa Clement,	1 00
For the best Gravenstein, to Josiah Crosby,	3 00
For the second best, to F. & L. Clapp,	2 00
For the third best, to Samuel Hartwell,	1 00
For the best Porter, to John Cummings,	3 00
For the second best, to Samuel Hartwell,	2 00
For the third best, to C. S. Williams,	1 00
For the best of any other variety, to Edwin Fletcher, for Garden Royal,	3 00
For the second best, to Samuel Hartwell, for Holden Pippin,	2 00
For the third best, to Joseph H. Fenno, for Summer Pippin,	2 00
PEARS.—For the best Andrews, to C. N. Brackett,	3 00
For the second best, to John L. Bird,	2 00
For the third best, to C. E. Grant,	1 00

For the best Doyenne Boussock, to E. W. Wood, .	$3 00
For the second best, to Hovey & Co., . . .	2 00
For the third best, to Charles Bird, . . .	1 00
For the best Flemish Beauty, to Joseph H. Fenno, .	3 00
For the second best, to C. E. Grant, . . .	2 00
For the best of any other variety, to J. B. Moore, for Belle Lucrative, ...	3 00
For the second best, to C. E. Grant, for Belle Lucrative, ...	2 00
For the third best, to J. H. Fenno, for Golden Beurre,	1 00
NATIVE GRAPES.—For the best of any variety, to J. B. Moore, for Moore's Early, ...	4 00
For the second best, to J. W. Talbot, for Norwood.	3 00
For the third best, to N. B. White, for Norfolk Muscat, ...	2 00
For the fourth best, to C. E. Grant, for Delaware, .	1 00
PEACHES.—For the best of any variety, to J. T. Foster, for Foster, ...	4 00
For the second best, to Samuel Hartwell, for Early Crawford, ...	3 00
For the third best, to Miss A. C. Wheeler, for Catherine, ...	2 00
For the fourth best, to J. H. Fenno, for Seedling, .	1 00

Gratuities:—

To F. R. Shattuck, for Apples, ...	1 00
John Cummings, " "	2 00
Asa Clement, for collection of Apples, . . .	1 00
C. N. Brackett, for Apples and Pears, . . .	2 00
Benj. T. Hunt, Jr., for Grapes, Pears, and Apples. .	1 00
John Fillebrown, for Clapp's Favorite Pears, . .	1 00
William A. Coolidge, for Pears, ...	1 00
A. S. M'Intosh, " "	1 00
Horace Partridge, for Grapes and Pears, . . .	1 00
Stiles Frost, for collection of Plums, . . .	2 00
J. H. Woodford, for Green Gage Plums, . . .	2 00
C. M. Atkinson, for Peaches, ...	1 00

ANNUAL EXHIBITION.

September 19, 20, 21, and 22.

Special Prizes offered by Peter Smith.

Apples.—For the largest and handsomest dish, to Charles Stearns, for Gravenstein.	$5 00
Pears.—For the largest and handsomest dish, to William T. Hall, for Beurre Clairgeau.	5 00
Foreign Grapes.—For the largest and handsomest bunch of Black, to E. W. Wood, for Black Hamburg. .	5 00
For the largest and handsomest bunch of White, to E. W. Wood, for Golden Hamburg. . . .	5 00

Society's Prizes.

Apples.—For the best Alexander, to Joseph H. Fenno.	3 00
For the best American Beauty, to Edwin Fletcher, .	3 00
For the best Baldwin, to T. M. Davis. . . .	4 00
For the second best, to Warren Heustis. . . .	3 00
For the third best, to Samuel Hartwell. . . .	2 00
For the fourth best, to John Cummings. . . .	1 00
For the best Blue Pearmain, to Samuel Hartwell. .	3 00
For the second best, to C. N. Brackett. . . .	2 00
For the best Cogswell, to John Cummings, . . .	3 00
For the second best, to Asa Clement. . . .	2 00
For the best Danvers Winter Sweet, to John Cummings.	3 00
For the second best, to C. N. Brackett, . . .	2 00
For the third best, to Asa Clement, . . .	1 00
For the best Duchess of Oldenburg, to F. P. Fisher, .	3 00
For the second best, to O. B. Hadwen, . . .	2 00
For the best Dutch Codlin, to Mrs. C. N. S. Horner, .	3 00
For the second best, to Joseph H. Fenno. . .	2 00
For the best Esopus Spitzenburg, to O. B. Hadwen, .	4 00
For the best Holden Pippin, to Samuel Hartwell, .	3 00
For the second best, to C. N. Brackett. . . .	2 00
For the third best, to John Cummings, . . .	1 00
For the best Fall Pippin, to Asa Clement. . . .	3 00
For the best Fameuse, to Asa Clement, . . .	3 00
For the second best, to E. W. Wood. . . .	2 00

For the best Foundling, to Edwin Fletcher, . .	$4 00
For the second best, to Samuel Hartwell, . .	3 00
For the third best, to J. W. Manning, . . .	2 00
For the fourth best, to Asa Clement, . . .	1 00
For the best Garden Royal, to Edwin Fletcher, . .	4 00
For the best Golden Russet, to Joseph H. Fenno, .	3 00
For the best Gravenstein, to S. G. Damon, . .	4 00
For the second best, to Warren Heustis, . . .	3 00
For the third best, to Josiah Crosby, . . .	2 00
For the fourth best, to Samuel Hartwell, . . .	1 00
For the best Hubbardston Nonsuch, to M. W. Chadbourne, ...	4 00
For the second best, to John Fillebrown, . .	3 00
For the third best, to George N. Noyes, . . .	2 00
For the fourth best, to Edwin Fletcher, . . .	1 00
For the best Hunt Russet, to Samuel Hartwell, . .	4 00
For the second best, to Asa Clement, . . .	3 00
For the third best, to D. W. Lothrop, . . .	2 00
For the fourth best, to J. B. Moore, . . .	1 00
For the best King of Tompkins County, to Edwin Fletcher, ...	4 00
For the second best, to Asa Clement, . . .	3 00
For the third best, to C. N. Brackett, . . .	2 00
For the best Ladies' Sweet, to Edwin Fletcher, .	3 00
For the second best, to J. W. Manning, . . .	2 00
For the third best, to C. N. Brackett, . . .	1 00
For the best Lyscom, to Asa Clement, . . .	3 00
For the second best, to Samuel Hartwell, . .	2 00
For the best Maiden's Blush, to Joseph H. Fenno, .	3 00
For the second best, to John Cummings, . . .	2 00
For the third best, to J. W. Manning, . . .	1 00
For the best Minister, to Asa Clement, . . .	3 00
For the second best, to William T. Hall, . . .	2 00
For the best Mother, to Edwin Fletcher, . . .	4 00
For the second best, to John Cummings, . . .	3 00
For the third best, to E. W. Wood, . . .	2 00
For the fourth best, to O. B. Hadwen, . . .	1 00
For the best Northern Spy, to John Cummings, . .	4 00
For the second best, to A. G. Bettison, . . .	3 00
For the third best, to Asa Clement, . . .	2 00

For the fourth best, to W. T. Hall, . . .	$1 00
For the best Orange Sweet, to S. G. Damon, . .	3 00
For the second best, to John Fillebrown, . .	2 00
For the best Porter, to Elisha Tower, . . .	4 00
For the second best, to John Cummings, . . .	3 00
For the third best, to Charles Bird, . . .	2 00
For the fourth best, to S. G. Damon, . . .	1 00
For the best Pumpkin Sweet, to Charles Stearns, .	4 00
For the second best, to Asa Clement, . . .	3 00
For the third best, to John Cummings, . . .	2 00
For the fourth best, to George H. Stevens, . .	1 00
For the best Rhode Island Greening, to E. W. Wood, .	4 00
For the second best, to C. N. Brackett, . . .	3 00
For the third best, to Charles Bird, . . .	2 00
For the fourth best, to W. A. Craft, . . .	1 00
For the best Roxbury Russet, to Warren Heustis, .	4 00
For the second best, to John L. De Wolf, . .	3 00
For the third best, to John Cummings. . . .	2 00
For the fourth best, to John L. Bird, . . .	1 00
For the best Sudbury Sweet, to Edwin Fletcher, . .	3 00
For the second best, to John Cummings, . .	2 00
For the best Twenty Ounce, to O. B. Hadwen, . .	3 00
For the best Washington Strawberry, to J. H. Fenno, .	3 00
For the best Yellow Bellflower, to F. B. Hayes, . .	3 00
For the second best, to Asa Clement, . . .	2 00
Second prize for Crab Apples, to Benj. F. Hunt, for Transcendent, ...	3 00
Third prize, to Horace Partridge, for Transcendent,	2 00
Fourth Prize, to J. E. Hoar, ...	1 00
PEARS.—For the best Adams, to Hovey & Co., . .	3 00
For the best Andrews, to Jesse Haley, . . .	4 00
For the second best, to Horace Partridge, . .	3 00
For the third best, to B. G. Smith, . . .	2 00
For the best Bartlett, to John McClure, . . .	4 00
For the second best, to William R. Austin, . .	3 00
For the third best, to Hovey & Co., . . .	2 00
For the fourth best, to Charles Bird, . . .	1 00
For the best Belle Lucrative, to Horace Eaton, . .	4 00
For the second best, to Horace Partridge, . .	3 00
For the third best, to C. N. Brackett, . . .	2 00

For the fourth best, to J. C. Park, ...	$1 00
For the best Beurre d'Anjou, to W. R. Austin, . .	4 00
For the second best, to J. McClure, . . .	3 00
For the third best, to J. H. Fenno, . . .	2 00
For the fourth best, to W. P. Walker, . . .	1 00
For the best Beurre Bosc, to W. R. Austin, . .	4 00
For the second best, to John L. Bird, . . .	3 00
For the third best, to W. T. Andrews, . . .	2 00
For the fourth best, to Joseph H. Fenno, . .	1 00
For the best Beurre Clairgeau, to Joseph H. Fenno, .	4 00
For the second best, to Horace Partridge, . .	3 00
For the third best, to John Fillebrown, . . .	2 00
For the fourth best, to Charles Bird, . . .	1 00
For the best Beurre Diel, to A. McDermott, . .	3 00
For the second best, to W. S. Janvrin, . . .	2 00
For the third best, to W. C. Strong, . . .	1 00
For the best Beurre Gris d' Hiver Nouveau, to Hovey & Co., ...	3 00
For the second best, to C. E. Grant, . . .	2 00
For the third best, to E. W. Wood, . . .	1 00
For the best Beurre Hardy, to C. F. Curtis, . .	4 00
For the second best, to W. R. Austin, . . .	3 00
For the third best, to Mrs. H. P. Kendrick, . .	2 00
For the fourth best, to W. P. Walker, . . .	1 00
For the best Beurre Langelier, to John L. Bird, . .	3 00
For the second best, to C. E. Grant, . . .	2 00
For the third best, to W. R. Austin, . . .	1 00
For the best Beurre Superfin, to J. C. Park, . .	4 00
For the second best, to Hovey & Co., . . .	3 00
For the third best, to Joseph H. Fenno, . . .	2 00
For the fourth best, to John L. Bird, . . .	1 00
For the best Buffum, to Mrs. H. P. Kendrick, . .	3 00
For the second best, to C. N. Brackett, . . .	2 00
For the third best, to Marshall P. Wilder, . .	1 00
For the best Caen du France, to Hovey & Co., . .	3 00
For the second best, to Marshall P. Wilder, . .	2 00
For the third best, to C. E. Grant, ...	1 00
For the best Dana's Hovey, to Eben Snow, . .	3 00
For the second best, to Hovey & Co., . . .	2 00
For the third best, to E. W. Wood, . . .	1 00

For the best De Tongres, to C. E. Grant, . . .	$3 00
For the second best, to S. G. Damon, . . .	2 00
For the third best, to T. M. Davis, ...	1 00
For the best Doyenne Boussock, to Marshall P. Wilder.	3 00
For the second best, to Hovey & Co., . . .	2 00
For the third best, to E. W. Wood, . . .	1 00
For the best Doyenne du Comice, to Marshall P. Wilder.	4 00
For the second best. to John C. Park. . . .	3 00
For the third best, to Joseph H. Fenno, . . .	2 00
For the fourth best, to Hovey & Co., . . .	1 00
For the best Duchesse d' Angouleme, to W. R. Austin,	4 00
For the second best, to J. McClure, . . .	3 00
For the third best, to Mrs. H. P. Kendrick, . .	2 00
For the fourth best, to Joseph H. Fenno, . .	1 00
Second prize for Flemish Beauty, to Joseph H. Fenno,	2 00
Third prize, to J. Cruickshanks.	1 00
For the best Fulton, to Charles F. Curtis, . . .	3 00
For the second best, to C. N. Brackett, . . .	2 00
For the third best, to J. C. Park, ...	1 00
For the best Glout Morceau, to W. P. Walker, . .	3 00
For the second best, to John L. DeWolf. . .	2 00
For the third best, to Mrs. H. P. Kendrick. . .	1 00
For the best Goodale. to W. R. Austin, . . .	3 00
For the second best, to Joseph H. Fenno, . .	2 00
For the third best, to Marshall P. Wilder, . .	1 00
For the best Howell, to W. S. Janvrin, . . .	4 00
For the second best, to Jesse Haley, . . .	3 00
For the third best, to Mrs. H. P. Kendrick, . .	2 00
For the fourth best. to S. G. Damon, . . .	1 00
For the best Lawrence, to Horace Partridge, . .	3 00
For the second best, to John McClure. . . .	2 00
For the third best, to John B. Moore, . . .	1 00
For the best Louise Bonne of Jersey, to William T. Hall.	4 00
For the second best, to Alexander Dickinson. . .	3 00
For the third best, to Charles Bird. . . .	2 00
For the fourth best, to T. M. Davis, . . .	1 00
For the best Marie Louise, to Alexander Dickinson. .	4 00
For the second best, to John L. DeWolf. . .	3 00
For the third best, to Hovey & Co., . . .	2 00
For the fourth best, to Marshall P. Wilder, . .	1 00

For the best Merriam, to Marshall P. Wilder, . .	$4 00
For the second best, to Hovey & Co., . . .	3 00
For the third best, to George B. Cutter, . . .	2 00
For the fourth best, to John L. DeWolf, . . .	1 00
For the best Moore's Pound, to Hovey & Co., . .	3 00
For the best Mount Vernon, to Walker & Co., . .	3 00
For the second best, to A. McDermott, . . .	2 00
For the third best, to Charles Bird, . . .	1 00
For the best Onondaga or Swan's Orange, to A. McDermott, ...	4 00
For the second best, to W. P. Walker, . . .	3 00
For the third best, to Charles Bird, ...	2 00
For the fourth best, to Horace Partridge, . .	1 00
For the best Paradis d' Automne, to Marshall P. Wilder,	4 00
For the second best, to Hovey & Co., . . .	3 00
For the third best, to John L. Bird, . . .	2 00
For the fourth best, to C. N. Brackett, . . .	1 00
For the best Pratt, to Lewis Hall, ...	3 00
For the second best, to Hovey & Co., . . .	2 00
For the third best, to Marshall P. Wilder, . .	1 00
For the best Seckel, to John L. Bird, ...	4 00
For the second best, to Lewis Hall, . . .	3 00
For the third best, to C. E. Grant, ...	2 00
For the fourth best, to Horace Partridge, . .	1 00
For the best Sheldon, to J. McClure, ...	4 00
For the second best, to George S. Harwood, . .	3 00
For the third best, to C. F. Curtis, ...	2 00
For the fourth best, to W. A. Craft, . . .	1 00
For the best Souvenir de Congrès, to Marshall P. Wilder,	3 00
For the best St. Michael Archangel, to Jesse Haley, .	4 00
For the second best, to T. M. Davis, . . .	3 00
For the third best, to Marshall P. Wilder, . .	2 00
For the fourth best, to Alexander Dickinson, . .	1 00
For the best Urbaniste, to J. C. Park, . . .	4 00
For the second best, to John B. Moore, . . .	3 00
For the third best, to E. W. Wood, . . .	2 00
For the fourth best, to Hovey & Co., . . .	1 00
For the best Vicar of Winkfield, to Horace Eaton, .	3 00
For the second best, to Charles Bird, . . .	2 00
For the third best, to Joseph H. Fenno, . . .	1 00

For the best Winter Nelis, to John L. Bird, . .	$3 00
For the second best, to W. P. Walker, . . .	2 00
For the third best, to W. A. Crafts, . . .	1 00
PEACHES.—Second prize for the best dish, to J. T. Foster, for Foster, ...	3 00
Third prize, to Samuel Hartwell, for Early Crawford,	2 00
For the best dish of Orchard House Culture, to John Falconer, for Lord Palmerston, ...	5 00
For the second best, to John Kelly, for Late Crawford,	4 00
For the third best, to John Falconer, for Late Crawford,	3 00
For the fourth best, to John Falconer, for Princess of Wales, ...	2 00
NECTARINES.—For the best dish, to John Falconer, for Rivers' Victoria, ...	4 00
PLUMS.—For the best collection, to Horace Eaton, . .	5 00
For the best dish, to Horace Eaton, for Reine Claude de Bavay, ...	3 00
For the second best, to J. M. Codman, . . .	2 00
For the third best, to H. V. Draper, for Coe's Golden Drop, ...	1 00
NATIVE GRAPES.—For the best six bunches Adirondac, to Horace Eaton, ...	3 00
For the second best, to S. G. Damon, . . .	2 00
For the best six bunches Concord, to Nathan Blanchard,	4 00
For the second best, to E. P. Richardson, . .	3 00
For the third best, to S. G. Damon, . . .	2 00
For the best Delaware, to W. H. Wilcox, . . .	3 00
For the second best, to S. G. Damon, . . .	2 00
For the third best, to F. & L. Clapp, . . .	1 00
For the best Hartford, to Horace Eaton, . . .	3 00
For the second best, to S. G. Damon, . . .	2 00
For the third best, to W. T. Andrews, . . .	1 00
For the best Israella, to S. G. Damon, . . .	3 00
For the second best, to J. L. Bird, ...	2 00
For the third best, to Horace Eaton, . . .	1 00
For the best of any other variety, to John B. Moore, for Moore's Early, ...	3 00
For the second best, to Horace Eaton, for Eumelan,	2 00
For the third best, to J. B. Moore, for Middlesex, .	1 00
FOREIGN GRAPES.—For the best six varieties, to C. M. Atkinson, ...	12 00

For the second best, to E. H. Luke, . . .	$10 00
For the third best, to B. G. Smith, . . .	8 00
For the best four varieties, to E. W. Wood, . .	8 00
Second prize for three varieties, to E. S. Rand, Jr.,	5 00
Third prize for two bunches of any Black Grape, to E. S. Rand Jr., ...	3 00
Third prize for two bunches of any White Grape, to E. S. Rand, Jr., ...	3 00

Gratuities for Apples:—

To Elisha Tower, for Queen of the Orchard, . . .	1 00
J. H. Fenno, for Orange Sweet, ...	1 00
Francis Marsh, for Rome Beauty, ...	1 00
Samuel Hartwell, for twenty-three varieties of Apples,	5 00
Mrs. C. N. S. Horner, for collection, . . .	2 00
A. G. Bettison, " "	1 00
O. B. Hadwen, " "	1 00
Josiah Newhall, " "	2 00
Francis Marsh, for Apples, ...	1 00
Asa Clement, " "	1 00
J. H. Fenno, for collection of Apples and Pears, .	3 00
John Cummings, for " " " . .	4 00
D. N. Stowers, for Apples and Pears, . . .	1 00
W. C. Strong, for Crab Apples, ...	1 00

Gratuities for Pears:—

To James Cruickshanks, for collection, ...	3 00
Horace Partridge, " "	2 00
Benjamin F. Hunt, " "	2 00
Lewis Hall, " "	2 00
C. E. Grant, " "	2 00
S. A. Merrill, " "	2 00
F. B. Hayes, " "	2 00
S. S. Getchell, " "	1 00
Geo. W. Ireland, " "	2 00
John B. Moore, " "	2 00
W. R. Austin, for Clapp's Favorite Pears, . .	1 00
F. & L. Clapp, for Seedling Pears (Harris), . .	2 00

Gratuities for Foreign Grapes: —

To E. S. Rand, Jr., for collection,	$3 00
B. G. Smith, " "	1 00

Gratuities for Native Grapes, etc.: —

To S. G. Damon, for Delaware,	1 00
W. T. Andrews, for collection,	1 00
Jonathan Mann,	1 00
Amos Bates,	1 00
E. Myrick,	1 00
N. B. White,	1 00
James H. Ricketts, for sixty-five varieties of Seedling Grapes,	10 00
John Falconer, for Peaches, orchard-house culture,	3 00
W. S. Janvrin, for Quinces,	1 00
Miss A. C. Wheeler, for Basket of Fruit,	2 00

SEPTEMBER 30.

Gratuities: —

To C. N. Brackett, for Pears,	1 00
C. E. Grant, for Seckel Pears,	2 00
F. & L. Clapp, for Seedling Pears,	2 00
J. Fisk Allen, for Native Grapes,	1 00
E. P. Richardson, for collection of Grapes,	2 00
M. W. Chadbourne, for Apples,	1 00

OCTOBER 7.

PEARS.—For the best Beurre Bosc, to S. C. Perkins,	4 00
For the second best, to W. R. Austin,	3 00
For the third best, to J. V. Wellington,	2 00
For the best Beurre Clairgeau, to W. T. Hall,	4 00
For the second best, to John Fillebrown,	3 00
For the third best, to Joseph H. Fenno,	2 00
For the best Beurre Diel, to T. M. Davis,	4 00
For the second best, to W. S. Janvrin,	3 00
For the third best, to Daniel Cross,	2 00
For the best Duchesse d'Angouleme, to John McClure,	4 00
For the second best, to W. R. Austin,	3 00
For the third best, to John C. Park,	2 00

For the best Louise Bonne of Jersey, to W. T. Hall, .	$4 00
For the second best, to T. M. Davis, . . .	3 00
For the third best, to Joseph H. Fenno, . . .	2 00
For the best Urbaniste, to Benj. B. Davis, . . .	4 00
For the second best, to John B. Moore, . . .	3 00
For the third best, to Joseph H. Fenno, . . .	2 00
Apples. — For the best Alexander, to Joseph H. Fenno.	3 00
For the best Fall Orange, to Samuel Hartwell, . .	3 00
For the second best, to O. B. Hadwen, . . .	2 00
For the best Gravenstein, to Samuel Hartwell. . .	3 00
For the second best, to S. G. Damon, . . .	2 00
For the best Orange Sweet, to S. G. Damon, . .	3 00
For the second best, to Edwin Fletcher, . . .	2 00
For the best Porter, to S. G. Damon, . . .	3 00
For the second best, to John Cummings, . .	2 00
For the best Twenty Ounce, to O. B. Hadwen. . .	3 00
Native Grapes. — For the best six bunches Catawba, to C. E. Grant, ...	3 00
For the second best, to Miss A. C. Wheeler. . .	2 00
For the best six bunches Concord, to Nathan Blanchard.	3 00
For the second best, to J. W. Talbot, . . .	2 00
For the best six bunches Creveling, to S. G. Damon. .	3 00
For the second best, to Horace Eaton. . . .	2 00
For the best six bunches Diana, to Horace Partridge, .	3 00
For the second best, to William H. Wilcox. . .	2 00
For the best six bunches Iona, to Eben Snow, . .	3 00
For the second best, to S. G. Damon. . . .	2 00
For the best six bunches Isabella, to J. V. Wellington,	3 00
For the second best, to Horace Partridge, . .	2 00
Second prize for Wilder (No. 4) to S. G. Damon,	2 00
Foreign Grapes. — Por the best three varieties, two bunches each, to Benj. G. Smith, for Muscat Hamburg, Golden Hamburg, and Wilmot's New Black Hamburg, ...	5 00
For the second best, to E. W. Wood, for Wilmot's Hamburg, Black Hamburg, and Victoria Hamburg, .	4 00
For the best two bunches of any variety, to E. W. Wood, for Wilmot's Hamburg, ...	3 00
For the second best, to B. G. Smith, for Golden Hamburg, ...	2 00

QUINCES.—For the best dish of any variety, to Charles Bird, for Orange Quince,	$3 00
For the second best, to W. S. Janvrin, for Apple Quince,	2 00
For the third best, to Frank M. Gilley, for Orange Quince,	1 00
Gratuities:—	
To Horace Partridge, for Pears,	2 00
Frank M. Gilley, " "	1 00
John Capen, " "	1 00
Charles Bird, " "	1 00
F. Hunt, Jr., " "	1 00
Robert Manning, " "	2 00
John McClure, " "	1 00
Joseph Parker, " "	1 00
John L. Bird, " "	2 00
J. Cruickshanks, " "	1 00
J. W. Talbot, " "	1 00
J. C. Park, " "	1 00
Hovey & Co., " "	2 00
Lewis Slack, " "	1 00
Josiah Crosby, " "	1 00
Miss H. M. Young, " "	1 00
C. N. Brackett, for collection of Pears,	2 00
G. M. Mellen, " " "	1 00
S. G. Damon, for Sheldon Pears,	1 00
Miss Sarah W. Story, for Apples,	1 00
O. B. Hadwen, " "	1 00
W. W. Winkley, " "	1 00
Elisha Tower, " "	1 00
Edwin Fletcher, for collection of Apples,	2 00
Samuel Hartwell " " "	2 00
John Cummings, for Apples and Pears,	5 00
T. M. Davis, " " " "	1 00
Augustus Torrey, " " " "	1 00
Charles Garfield, " " " "	1 00
George Frazier, " collection of Apples and Pears,	2 00
Joseph H. Fenno, " " " " " "	3 00
S. N. Gaut, " " " " " "	2 00
C. E. Grant, " " " " " "	3 00

To B. G. Smith, for Apples and Quinces,		$1 00
John B. Moore, for collection of Grapes,		2 00
Horace Eaton, for Grapes,		1 00
E. H. Hitchings, for Isabella Grapes,		1 00
B. G. Smith, for collection of Foreign Grapes,		2 00

October 14.

Gratuities:—

To W. E. Coffin, for Pears,		1 00
C. E. Grant, for Goodale Pears,		1 00
A. H. Safford, for Duchesse d' Angouleme Pears,		1 00
E. Faxon, for Beurre Diel Pears,		1 00
Miss A. C. Wheeler, for Grapes,		1 00

October 21.

Gratuities:—

To John E. Hopkins, for Baldwin Apples,		1 00
M. W. Chadbourne, for Blue Pearmain Apples,		1 00
Mrs. C. N. S. Horner, for Pears and Apples,		2 00
O. B. Hadwen,	" " " "	2 00
Miss A. C. Wheeler,	" " " "	1 00
G. M. Mellen,	" " " "	1 00

October 28.

Gratuities:—

To Charles L. Fowle, for Apples,		1 00
F. & L. Clapp, for Seedling Pears,		2 00
Benj. G. Smith, for Muscat Hamburg Grapes,		1 00

November 4.

Gratuities:—

To Jesse Haley, for Pears,		1 00
A. S. M'Intosh, for collection of Pears,		3 00
M. W. Chadbourne, for Apples,		1 00
C. N. Brackett;	" "	1 00
O. B. Hadwen,	" "	1 00
Horace Partridge, for collection of Apples,		1 00
Josiah Newhall,	" " "	2 00
Asa Clement,	" " "	2 00

To William T. Hall, for Apples and Pears, . . .	$1 00
J. T. Foster, " " " " . . .	2 00
A. J. Dean, " " " " . . .	1 00
D. B. Flint, " " " " . . .	2 00
S. N. Gaut, " " " " . . .	2 00
T. M. Davis, " " " " . . .	2 00

NOVEMBER 11.

PEARS.—For the best Beurre d' Anjou, to W. R. Austin,	3 00
For the second best, to Joseph H. Fenno, . .	2 00
For the best Dana's Hovey, to Hovey & Co.. . .	3 00
For the second best, to T. M. Davis, . . .	2 00
For the best Easter Beurre, to Alexander Dickinson, .	3 00
For the second best, to Joseph H. Fenno, . .	2 00
For the best Glout Morceau, to A. S. M'Intosh, . .	3 00
For the second best, to W. P. Walker, . . .	2 00
For the best Lawrence, to Joseph H. Fenno, . .	3 00
For the second best, to John McClure, . . .	2 00
For the best Winter Nelis, to John L. Bird, . .	3 00
For the second best, to W. P. Walker, . . .	2 00

French Premiums.

WINTER APPLES.—For the best Baldwin, to John Cummings, ...	3 00
For the second best, to J. T. Foster, . . .	2 00
For the best Hubbardston Nonsuch, to John B. Moore,	3 00
For the second best, to Joseph H. Fenno, . .	2 00
For the best King of Tompkins County, to Asa Clement,	3 00
For the second best, to Edwin Fletcher, . . .	2 00
For the best Northern Spy, to S. N. Gaut, . . .	3 00
For the second best, to W. T. Hall, . . .	2 00
For the best Rhode Island Greening, to Frank M. Gilley,	3 00
For the second best, to E. W. Wood, . . .	2 00
For the best Roxbury Russet, to John Cummings, .	3 00
For the second best, to Joseph H. Fenno, . .	2 00

Gratuities:—

To John L. Bird, for Beurre d'Aremberg Pears, . .	1 00
J. C. Park, for Doyenne du Comice Pears, . .	1 00
J. Cruickshanks, for Beurre d'Anjou Pears, . .	1 00
W. P. Walker, for Vicar of Winkfield Pears, . .	1 00

To Alexander Dickinson, for Pears,	$1 00
T. M. Davis, " "	1 00
S. N. Gaut, " "	1 00
John McClure, " "	1 00
C. E. Grant, for collection of Pears,	2 00
B. G. Smith, " " "	1 00
Edwin Fletcher, for collection of Apples,	2 00
Asa Clement, " " "	2 00
Moses Taylor, " " "	2 00
Samuel Hartwell, " " "	1 00
John Cummings, for collection of Apples and Pears,	3 00
Joseph H. Fenno, " " "	2 00
Miss A. C. Wheeler, for collection,	1 00
James Nugent, for Oranges,	1 00

The Society's Silver Medal was awarded to J. H. Fenno, for Seedling Cherry, Norfolk.

The Prospective Prize of fifty dollars was awarded to Marshall P. Wilder, for the best Seedling Strawberry, after a public trial of three years, the President Wilder, for its size, beauty, and quality.

The amount awarded to each contributor is as follows:

Allen, John Fisk	$6	Coffin, William E.	$1
Andrews, W. T.	4	Comley, James	9
Atkinson, C. M.	17	Cooledge, W. D.	1
Austin, W. R.	32	Craft, George	1
Bates, Amos	23	Crafts, William A.	3
Bettison, A. G.	4	Crosby, Josiah	9
Bird, Charles	34	Cross, Daniel	2
Bird, John L.	31	Cruickshanks, George	1
Blanchard, Nathan	7	Cruickshanks, James	6
Bowers, H. C.	4	Cummings, John	65
Brackett, C. N.	44	Curtis, Charles F.	15
Capen, Aaron D.	5	Cutter, George B.	2
Capen, John	1	Damon, S. G.	39
Chadbourne, M. W.	11	Davis, B. B.	20
Chadwick, E. R.	3	Davis, T. M.	26
Child, William C.	5	Dean, A. J.	1
Clapp, F & L.	20	DeWolf, John L.	9
Clement, Asa	50	Dickinson, Alexander	12
Codman, J. M.	2	Draper, H. V.	1

Eaton, Horace,	$53
Eaton, Joseph B.	1
Falconer, John	26
Faxon, E.	1
Felton, A. W.	3
Fenno, J. H.	151
Fillebrown, John	17
Fisher, J. R.	1
Fisher, F. P.	3
Fletcher, Edwin	52
Flint, D. B.	5
Fobes, Mrs. B.	4
Foster, J. T.	15
Fowle, Charles L.	1
Fraizer, George	2
Frost, Stiles	2
Garfield, Charles	33
Gaut, S. N.	8
Gerry, C. F.	1
Getchell, S. S.	1
Gill, Mrs. E. M.	14
Gilley, Frank M.	17
Gould, Frederick	2
Grant, C. E.	53
Hadwen, O. B.	25
Haley, Jesse	12
Hall, Lewis	8
Hall, William T.	23
Hartwell, Samuel	59
Harwood, G. S.	3
Hayes, F. B.	5
Heustis, Warren	36
Hill, George	2
Hitchings, E. H.	1
Hoar, J. E.	1
Hodgkins, John E.	1
Horner, Mrs. C. N. S.	8
Hovey & Co.	70
Hunt, B. F.	6
Hunt, F., Jr.	1
Ireland, George W.	$2
Irvin, John	1
Janvrin, W. S.	18
Joyce, Mrs. S.	1
Kelley, John	4
Kendrick, Mrs. H. P.	10
Kingman, C. D.	18
Langworthy, I. P.	4
Lothrop, D. W.	2
Luke, E. H.	10
Mann, Jonathan	1
Manning, J. W.	5
Manning, Robert	6
Marsh, Francis	2
McClure, John	38
McDermott, A.	9
Mellen, G. M.	5
Merrill, S. A.	2
M'Intosh, A. S.	11
Mitchell, E. M.	1
Moore, John B.	124
Myrick, E.	1
Newhall, Josiah	4
Newhall, Wilbur T.	2
Noyes, George N.	11
Nugent, James	14
Oldreive, R.	1
Park, John C.	23
Parker, Joseph	1
Partridge, Horace	27
Perkins, S. C.	4
Pierce, George W.	11
Pillsbury, Enoch	1
Rand, E. S., Jr.	14
Richards, J. S.	3
Richardson, C. E.	2
Richardson, E. P.	17
Ricketts, J. H.	10
Russell, Walter	1
Safford, A. H.	1

Shattuck, F. R.	$1	Walker & Co.	$3
Shepherd, C. W.	4	Ware, Benj. P.	2
Slack, Lewis	2	Waters, G. F.	3
Smith, B. G.	78	Wellington, J. V.	5
Smith, H. H.	2	Weston, Daniel,	1
Snow, Eben	9	Wheeler, Miss A. C.	10
Stevens, Charles	9	White, N. B.	10
Stevens, George M.	3	Wilcox, J. A. J.	4
Story, Sarah W.	1	Wilcox, William H.	5
Stowers, D. W.	1	Wilder, Marshall P.	80
Strong, W. C.	1	Williams, C. S.	1
Sullivan, J. L. D.	2	Wilson, H. W.	1
Talbot, J. W.	6	Winkley, W. W.	1
Taylor, Moses	2	Wiswall, H. M.	5
Torrey, Augustus	1	Wood, E. W.	45
Tower, Elisha	6	Wood, W. K.	3
Turner, R. W.	14	Woodford, J. H.	2
Walker, T. W.	4	Young, H. M.	1
Walker, W. P.	15		

Amount of Appropriation,		$2,100
Amount of Peter Smith fund,		20
		$2,120
Prizes awarded,	$1,423	
Prospective Prize to Marshall P. Wilder,	50	
Smith Prizes,	20	
Gratuities awarded,	527	2,020
Balance not awarded,		$100

REPORT

OF THE

Committee on Vegetables,

FOR THE YEAR 1876.

BY C. N. BRACKETT, CHAIRMAN.

The Committee on Vegetables present to the Society the following brief report of their doings for the year 1876.

The general impression that we derive from the exhibitions of the year is, that, taken as a whole, those of the past season have been, beyond dispute, the best ever made in this department since the organization of the Society. The number, quality, and variety of specimens on exhibition have furnished pleasing proofs of the high state of cultivation in this vicinity, and have shown that our leading cultivators are striving, in honorable competition, to bring to perfection the various products of the field and garden. The weekly exhibitions have been much in advance of those of last year, and if we take into consideration the near approach of many of the specimens offered, to the desired standard of excellence, together with the constantly increasing competition in this department of the Society's exhibitions, we are led to remark, that a spirit of enterprise is abroad, which is not only encouraging, but gives the fairest promise for the future. Every cultivator who desires to be successful, or who expects to realize a profit from his crops, should keep a two-fold purpose in view, in respect to the quality of the various productions he raises: first, never to allow any good thing to deteriorate on his hands; and second, to be constantly taxing the forces of nature to produce a better than the best product yet known. It is an established fact in vegetable life, that deterioration is quite as possible as improvement. It is not

enough to have "the earth yield her increase" in abundance; that increase should be made better in quality, and more desirable year by year.

Much of the improvement noticed in some of the leading varieties of vegetables during the past few years, is due to the increased appreciation by cultivators of the importance of pure and reliable seeds. This is a matter which we are convinced is receiving more attention than formerly. Some of the best specimens seen on our tables, and which have taken first prizes the past season, have been found in the collections of those contributors who grow their own seed, and in some instances make a specialty of some particular object, as the cauliflower, cabbage, melon, squash, celery, onion, etc., or some one of the various root crops. Year after year, by constant care in their selection, and by saving from only the earliest and most perfect specimens, their stock of seeds has been improved to such an extent as to be sought after from far and near, and to command almost fabulous prices, if they should chance to have a surplus to dispose of. Hence, it requires very little common sense to perceive that a cultivator who is satisfied to gather his seed carelessly and promiscuously, cannot successfully compete with his more careful and prudent neighbor, either in the prices which he receives for his products in the market, or in taking first prizes at exhibitions.

The occasional exhibition of Lettuce, Cucumbers, Mushrooms, Radishes, Dandelions, and other forced vegetables, previous to the opening exhibition, were made in the Library Room of the Society, and assisted to make the weekly shows interesting during the late winter and early spring months. For these contributions we are mainly indebted to Josiah Crosby, Hovey & Co., James Comley, Walter Russell, and George Hill.

At the Azalea Exhibition, April 8th, the display of forced vegetables was not so large as on some former occasions, but what was wanting in quantity was more than made up in the superior quality of the specimens offered. At this exhibition, C. M. Atkinson showed specimens of a new and very beautiful variety of Parsley, distinct and very ornamental, and which your Committee consider a decided acquisition. June 3d, we were favored with some very fine samples of Asparagus, from John B. Moore and Samuel Hartwell, Mr. Moore, as usual, taking the first prize. Large and superior collections were also shown at this time by Josiah Crosby, Walter

Russell, M. W. Chadbourne, and others. On June 27th and July 8th, the exhibitions were unusully fine, and the different varieties shown bore ample evidence of care and skill in their cultivation. July 15th, some exceedingly fine and well grown specimens of the Black Pekin Egg Plant were exhibited by James Bard, gardener to Harvey D. Parker, who also showed fine specimens of Boston Market and Canada Victor Tomatoes.

The Emery Tomato, of which favorable mention was made in our report for 1875, was again on exhibition during the past season. It is a valuable acquisition, and bids fair, in the opinion of your Committee, to rival many long established favorites. The specimens of Pekin and Large Purple Egg Plant, shown at the exhibition on the 12th of August, were the largest and most perfectly grown your Committee have ever seen. The contributors were George Hill, Josiah Crosby, Walter Russell, and George W. Pierce. August 26th, and again at the Annual Exhibition, C. M. Atkinson exhibited a tomato under the name of the "Kelly." It is a large, smooth, solid, and remarkably handsome variety. Mr. Atkinson speaks very highly of its merits, and considers it superior to some of the older sorts, and worthy of trial.

Established varieties of potatoes have taken the lead this season for nearly all the prizes at the Annual Show. No large collections were on exhibition, and no new varieties, except a seedling from L. W. Weston, which he enters for the Society's Prospective Prize. No description of this seedling has been furnished your Committee.

It has not escaped the attention of cultivators, that insects destructive to vegetation are alarmingly on the increase. If we may be allowed to judge from the experience of the past season, "eternal vigilance" is to be the price of potatoes next year. A neighbor showed us his field the past summer, which was literally alive with that new pest, the Colorado beetle, and, very naturally, inquired how to exterminate them. This is a question perhaps not very easily answered, but it is one which every cultivator must look squarely in the face, and it presents a wide and open field for experiment.

The display of vegetables at the Annual Exhibition was pronounced the best ever made. There was no part of the vegetable garden left unrepresented at this season. Among the largest contributors were Walter Russell, John Cummings, S. A. Merrill, and Mrs. M. T. Goddard, whose collections were much admired.

The special prizes offered for Celery, from the fund donated by Peter Smith, were awarded to George Hill for the best six roots, and Josiah Crosby for the second best.

In conclusion, your committee would signify their entire satisfaction with the results of the past year's exhibitions. The improvement witnessed in this department is full of promise, and should encourage us to greater perseverance in the future. The attention of contributors is called to important changes in the Schedule of Prizes for the coming year. Also to Rule 4, page 29.

The annexed list shows the amount of prizes and gratuities awarded by your Committee the past year.

All of which is respectfully submitted.

C. N. Brackett,
Walter Russell,
George Hill,
George W. Pierce,
John Fillebrown,
Josiah Crosby,
Anthony Hatch,
} *Vegetable Committee.*

PRIZES AND GRATUITIES FOR VEGETABLES.

DECEMBER 18, 1875.

Gratuity: —

To Walter Russell, for Cauliflowers, ...	$2 00

JANUARY 1, 1876.

Gratuity: —

To C. H. Brackett, for Mushrooms, ...	1 00

JANUARY 8.

Gratuities:—

To Twombly & Son, for Dandelions, ...	1 00
C. H. Brackett, for Mushrooms, ...	1 00

JANUARY 15.

Gratuity: —

To James Comley, for Rhubarb, ...	2 00

JANUARY 22.

Gratuities:—

To Josiah Crosby, for Celery, ...	2 00
James Comley, " Rhubarb, ...	2 00
C. H. Brackett, " Mushrooms, ...	1 00

JANUARY 29.

Gratuities: —

To C. H. Brackett, for Mushrooms, ...	1 00
Hovey & Co., " "	1 00

FEBRUARY 5.

Gratuity: —

To James Comley, for Rhubarb, ...	3 00

FEBRUARY 12.

Gratuities:—

To C. H. Brackett, for Mushrooms and Rhubarb, . .	$3 00
James Comley, for Rhubarb, ...	2 00
George W. Pierce, for Tennisball Lettuce, . .	2 00

FEBRUARY 19.

Gratuity: —

To Walter Russell, for Tennisball Lettuce, . . .	2 00

MARCH 4.

Gratuity: —

To James Comley, for Rhubarb, ...	2 00

MARCH 11.

Gratuities:—

To W. Russell, for collection, ...	4 00
J. Crosby, " "	4 00
George W. Pierce, for Lettuce, ...	2 00
George Hill, " "	2 00
James Comley, for Mushrooms, ...	2 00

MARCH 18.

Gratuities:—

To W. Russell, for collection, ...	3 00
George Hill, " Tennisball Lettuce, ...	2 00
J. Comley, " Mushrooms, ...	2 00

MARCH 25.

Gratuities: —

To W. Russell, for collection, ...	4 00
George F. Stone, for Tennisball Lettuce, . . .	2 00
George Hill, " " " . . .	2 00

MARCH 25.

Gratuities: —

To James Comley, for Mushrooms, ...	3 00
Josiah Crosby, for Lettuce, ...	2 00

AZALEA EXHIBITION.

April 8.

Parsley. — For the best dish, of two quarts, to C. M. Atkinson,	$4 00
Lettuce. — For the best four heads of Tennisball, to Josiah Crosby,	4 00
For the second best, to George F. Stone,	3 00
For the third best, to W. T. Andrews,	2 00
Radishes. — For the best four bunches of Long Scarlet, to Walter Russell,	4 00
For the second best, to J. Crosby,	3 00
For the third best, to C. W. Chamberlain,	2 00
For the best Turnip Rooted, to W. Russell,	4 00
Rhubarb. — For the best twelve stalks, to James Comley,	4 00
Cucumbers. — For the best pair, to J. W. Twombly & Son,	4 00
Mushrooms. — For the best dish, to Hovey & Co.,	4 00
Gratuities: —	
To W. Russell, for collection,	2 00
C. W. Chamberlain, for Lettuce,	2 00

April 22.

Gratuity: —	
To G. F. Stone, for Lettuce,	2 00

May 6.

Gratuity: —	
To W. Russell, for collection,	4 00

May 13.

Gratuities: —	
To W. Russell, for collection,	4 00
J. Crosby, " Radishes,	1 00
J. B. Moore, " Asparagus,	2 00
B. G. Smith " "	1 00
C. M. Atkinson, for Turnip Greens,	1 00
M. W. Chadbourne, for Rhubarb,	2 00

May 20.

Gratuities: —

To W. Russell, for collection,	$3 00
M. W. Chadbourne, for Asparagus,	2 00
B. G. Smith, " "	1 00
J. B. Moore, " "	2 00
Charles Garfield, for Lettuce,	2 00
Alexander Anderson, for Rhubarb,	2 00

May 27.

Gratuities: —

To J. B. Moore, for Asparagus,	2 00
Alexander Anderson, for Rhubarb,	2 00
Mrs. E. M. Gill, " "	1 00

June 3.

Asparagus. — For the best four bunches, to J. B. Moore,	4 00
For the second best, to Samuel Hartwell,	3 00
For the third best, to M. W. Chadbourne,	2 00
Cucumbers. — For the best pair, to J. Crosby,	4 00
For the second best, to W. Russell,	3 00
Rhubarb. — For the best twelve stalks, to Alexander Dickinson,	4 00
For the second best, to C. F. Curtis,	3 00
For the third best, to S. Hartwell,	2 00
Radishes. — For the best Long Scarlet, to J. Crosby,	4 00
For the second best, to W. Russell,	3 00
For the best Turnip Rooted, to W. Russell,	4 00
Lettuce. — For the best four heads, to Josiah Crosby, for All the Year Round,	4 00
For the second best, to Josiah Crosby, for Tennisball,	3 00
For the third best, to Charles Garfield,	2 00
Carrots. — For the best twelve Short Scarlet, to J. Crosby,	4 00

Gratuities: —

To Josiah Crosby, for Egyptian Beets,	2 00
Walter Russell, for collection,	2 00
E. W. Whitney, for Asparagus,	1 00
A. D. Capen, for Rhubarb,	1 00

JUNE 10.

Gratuity:—

To A. S. M'Intosh, for Artichokes, ...	$1 00

JUNE 17.

Gratuity:—

To M. W. Chadbourne, for Hill's Early Peas, . .	3 00

JUNE 21.

Gratuities:—

To M. W. Chadbourne, for collection, ...	4 00
Walter Russell, " "	6 00
C. N. Brackett, for Lettuce, ...	2 00
C. E. Grant, for collection of Peas, ...	3 00
Charles Garfield, for Peas, ...	1 00
W. C. Child, for Early Dexter Peas, ...	2 00

JUNE 24.

Gratuities:—

To M. W. Chadbourne, for collection of Peas, . .	1 00
G. M. Mellen, " " " . .	2 00

STRAWBERRY SHOW.

JUNE 27.

PEAS.—For the best peck, to W. C. Child, for Advancer,	$4 00
For the second best, to Walter Russell, for Alpha,	3 00
For the third best, to G. M. Mellen, ...	2 00
BEETS.—For the best Turnip Rooted, to J. Crosby, .	4 00
For the second best, to W. Russell, ...	3 00
For the third best, to George W. Pierce, ...	2 00
For the best Egyptian, to J. Crosby, ...	4 00
For the second best, to G. W. Pierce, ...	3 00
CUCUMBERS.—For the best pair, to Walter Russell, .	4 00
For the second best, to J. Crosby, ...	3 00
For the third best, to George W. Pierce, ...	2 00
LETTUCE.—For the best, of any variety, to G. W. Pierce,	4 00
For the second best, to W. Russell, ...	3 00
For the third best, to C. N. Brackett, ...	2 00

CARROTS.—For the best twelve Short Scarlet, to J. Crosby,	$4 00
ONIONS.—For the best twelve, to J. Crosby, . . .	4 00
POTATOES.—For the best peck, to C. D. Kingman, for Alpha, ...	4 00

Gratuities:—

To Josiah Crosby, for Tailby's Hybrid Cucumbers, . .	2 00
George W. Pierce, for collection, ...	3 00
Walter Russell, " "	2 00
Josiah Crosby, " "	4 00

JULY 1.

Gratuity:—

To W. C. Child, for Advancer Peas, ...	2 00

JULY 8.

BEANS.—For the best peck of Cranberry, to Josiah Crosby,	4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to Walter Russell, for Horticultural,	2 00
SQUASHES.—For the best four Summer, to Walter Russell,	3 00
PEAS.—For the best peck, to G. M. Mellen, for Advancer,	4 00
ONIONS.—For the best twelve specimens, to Josiah Crosby,	4 00
CABBAGES.—For the best four, to Walter Russell, for Wyman, ...	4 00
For the second best, to J. Crosby, for Wyman, .	3 00
For the third best, to J. Crosby, for Wakefield, .	2 00
TOMATOES.—For the best twelve, to J. Crosby, for Canada Victor, ...	4 00
For the second best, to George W. Pierce, for Emery,	3 00

Gratuities:—

To C. D. Kingman, for Wax Beans, ...	1 00
W. C. Child, " " "	1 00
W. Russell, " " "	1 00
W. K. Wood, " " "	1 00
C. N. Brackett, for Dwarf Egg Plant, . . .	1 00
Joseph Tailby, for collection of New Peas, . .	3 00
George W. Pierce, for collection, ...	1 00

JULY 15.

TOMATOES.—For the best twelve, to W. Russell, for Boston Market,	$4 00
For the second best, to James Bard, for Boston Market,	3 00
For the third best, to George W. Pierce, for Gen. Grant,	2 00
CORN.—For the best twelve ears of Sweet, to W. C. Child,	4 00
Gratuities:—	
To James Bard, for Black Pekin Egg Plant,	2 00
E. W. Wood, for Tom Thumb Corn,	1 00
Josiah Crosby, for Early Rose Potatoes,	2 00
C. N. Brackett, for collection,	3 00
W. C. Child, " "	1 00

JULY 22.

SQUASHES.—For the best four Marrow, to Josiah Crosby,	4 00
CABBAGES.—For the best Drumhead to W. Russell,	4 00
TOMATOES.—For the best twelve, to George Hill, for Emery,	4 00
For the second best, to C. N. Brackett, for Gen. Grant,	3 00
For the third best, to C. N. Brackett, for Emery,	2 00
Gratuities:—	
To George Hill, for Egg Plant and Corn,	3 00
C. E. Grant, for Corn,	1 00
W. K. Wood, for Wax Beans,	1 00
L. W. Weston, for collection,	3 00
W. Russell, " "	4 00
W. C. Child, " "	3 00

JULY 29.

TOMATOES.—For the best twelve, to C. N. Brackett, for Gen. Grant,	4 00
For the second best, to George Hill, for Emery,	3 00
For the third best, to C. N. Brackett, for Emery,	2 00
For the fourth best, to George Hill, for Boston Market,	1 00

CORN.—For the best twelve ears of Sweet, to W. Russell,	$4 00
For the second best, to S. Hartwell, . . .	3 00
For the third best, to C. N. Brackett, . . .	2 00

JULY 29.

EGG PLANT.—For the best four specimens of Black Pekin, to Josiah Crosby, ...	4 00
For the second best, to James Bard, . . .	3 00
For the third best, to G. W. Pierce, . . .	2 00
Gratuities:—	
To Josiah Crosby, for Onions, ...	1 00
W. C. Child, for Sieva Beans, ...	1 00
G. M. Mellen, for collection, ...	1 00
C. E. Grant, " "	2 00
Walter Russell, for Purple Egg Plant, . . .	3 00
" " " collection of Tomatoes, three varieties, ...	2 00
George W. Pierce, for Emery Tomatoes, . . .	1 00

AUGUST 5.

SWEET CORN.—For the best Early Crosby, to Samuel Hartwell, ...	4 00
For the second best, to M. W. Chadbourne, . .	3 00
For the third best, to C. E. Grant, . . .	2 00
For the best of any other variety, to Samuel Hartwell, for Burr's, ...	4 00
For the second best, to John B. Moore, for Early Concord, ...	3 00
For the third best, to C. N. Brackett, for Triumph, .	2 00
SQUASHES.—For the best four Marrow, to Walter Russell,	4 00
For the second best, to Josiah Crosby, . . .	3 00
TOMATOES.—For the best twelve specimens of Gen. Grant, to C. N. Brackett, ...	4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to James Bard, ...	2 00
For the best twelve specimens of Boston Market, to George Hill, ...	4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to George W. Pierce, . .	2 00

For the best of any other variety, to C. N. Brackett, for Emery,	$4 00
For the second best, to G. W. Pierce, for Emery,	3 00
For the third best, to George Hill, for Emery,	2 00

Gratuities:—

To C. M. Atkinson, for collection,	4 00
Walter Russell, for Egg Plant and Cabbages,	3 00
N. B. White, for Early Rose Potatoes,	1 00
C. N. Brackett, for Crosby Corn and Egg Plant,	2 00
D. B. Flint, for Lima Beans,	2 00
C. E. Grant, " " "	2 00

AUGUST 12.

EGG PLANT.—For the best four specimens of Black Pekin, to Josiah Crosby,	4 00
For the second best, to G. W. Pierce,	3 00
For the best Large Round Purple, to George Hill,	4 00
For the second best, to Walter Russell,	3 00
For the third best, to Josiah Crosby,	2 00
GREENFLESH MELONS.—For the best four specimens, to George Hill,	4 00
or the second best, to Walter Russell,	3 00
For the third best, to Josiah Crosby,	2 00
MUSKMELONS. — For the best four specimens, to George Hill,	4 00
For the second best, to Josiah Crosby,	3 00
TOMATOES. — For the best twelve of any variety, to C. N. Brackett, for Emery,	4 00
For the second best, to C. N. Brackett, for Gen. Grant,	3 00
For the third best, to George W. Pierce, for Emery,	2 00
BEANS. — For the best two quarts of Large Lima, to C. E. Grant,	4 00
For the second best, to D. B. Flint,	3 00
For the third best, to B. G. Smith,	2 00

Gratuities: —

To G. W. Pierce, for Texan Egg Plant,	1 00
Hovey & Co., for New Zealand Spinach,	1 00

To Samuel Hartwell, for Burr's Corn, ...	$1 00
W. Russell, for Stowell's Evergreen Corn, . .	1 00
C. N. Brackett, for Triumph Corn, ...	1 00

AUGUST 19.

GREENFLESH MELONS. — For the best four of any variety, to Walter Russell, ...	4 00
For the second best, to George Hill, . .	3 00
MUSKMELONS. — For the best four, to George Hill, . .	4 00
EGG PLANT. — For the best four specimens of Large Round Purple, to W. Russell, ...	4 00
For the second best, to George W. Pierce, . .	3 00
For the third best, to George Hill, ...	2 00
For the best Black Pekin, to George W. Pierce, . .	4 00

Gratuities: —

To John Cummings, for collection, ...	3 00
C. N. Brackett, " "	3 00
C. E. Grant, " " . , ...	2 00
W. Russell, " "	2 00
Samuel Hartwell, " "	1 00
H. C. Bowers, " "	1 00
Joseph Tailby, " Moore's Vegetable Cream Squash,	1 00
D. B. Flint, " Sieva Beans, ...	1 00
George Craft, " Burr's Corn, ...	1 00

AUGUST 26.

POTATOES. — For the best peck of any variety, to Mrs. M. T. Goddard, for Early Rose, ...	4 00
For the second best, to L. M. Weston, for Snow Flake, ...	3 00
For the third best, to J. Cummings, for Snow Flake,	2 00
BEANS. — For the best two quarts of Large Lima, to B. G. Smith, ...	4 00
For the second best, to C. E. Grant, ...	3 00
For the third best, to Mrs. E. M. Gill, ...	2 00
PEPPERS. — For the best twelve specimens, to Josiah Crosby, ...	4 00
For the second best, to C. N. Brackett, ...	3 00
For the third best, to Walter Russell, ...	2 00

Gratuities:—

To John Fillebrown, for Greenflesh Melons,	$1 00
Miss Sabra Carter, for Melons,	1 00
C. M. Atkinson, for Kelly Tomatoes,	1 00
J. B. Moore, for Cauliflowers,	2 00
Mrs. M. T. Goddard, for collection,	2 00
Walter Russell, " "	2 00
John Cummings, " "	4 00
George Craft, " "	1 00
C. N. Brackett, " "	2 00

SEPTEMBER 2.

BEANS.—For the best two quarts of Large Lima, to C. E. Grant,	4 00
For the second best, to B. G. Smith,	3 00
For the third best, to Mrs. E. M. Gill,	2 00
WATERMELONS.—For the best pair, to Samuel Hartwell, for Black Spanish,	4 00
For the second best, to J. S. Richards, for Mountain Sprout,	3 00
For the third best, to Samuel Hartwell, for Mountain Sweet,	2 00
GREENFLESH MELONS.—For the best four specimens, to George Russell,	4 00
For the second best, to George W. Pierce,	3 00
For the third best, to Walter Russell,	2 00
CELERY.—For the best four roots, to Josiah Crosby,	4 00
PEPPERS.—For the best twelve, to Josiah Crosby,	4 00
For the second best, to C. N. Brackett,	3 00
For the third best, to Walter Russell,	2 00

Gratuities:—

To John Cummings, for collection,	4 00
George W. Pierce, " "	2 00

SEPTEMBER 9.

CELERY.—For the best four roots, to Josiah Crosby,	4 00
SALSIFY.—For the best twelve specimens, to George W. Pierce,	4 00

For the second best, to Josiah Crosby, . . .	$3 00
For the third best, to Walter Russell, . . .	2 00
CAULIFLOWERS.—For the best four, to John B. Moore, .	4 00
For the second best, to John Cummings, . .	3 00
Gratuity:—	
To John Cummings, for collection, ...	2 00

ANNUAL EXHIBITION.

SEPTEMBER 19, 20, 21, AND 22.

Special Prize offered by Peter Smith.

CELERY.—For the best six roots, to George Hill, . .	$8 00
For the second best, to Josiah Crosby, . . .	5 00

Society's Prizes.

BEETS.—For the best Turnip Rooted, twelve specimens, to George F. Stone, ...	4 00
For the second best, to Mrs. M. T. Goddard, . .	3 00
For the third best, to John Fillebrown, . . .	2 00
For the best Long Blood, to Josiah Crosby, . .	4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to Mrs. M. T. Goddard, . .	2 00
CARROTS.—For the best Short Scarlet, twelve specimens, to W. Russell, ...	4 00
For the second best, to George W. Pierce, . .	3 00
For the third best, to Mrs. M. T. Goddard, . .	2 00
or the best Long Orange, to Walter Russell, . .	4 00
For the second best, to J. Crosby, ...	3 00
For the third best, to Mrs. M. T. Goddard, . .	2 00
For the best Intermediate, to John Fillebrown, . .	4 00
For the second best, to Josiah Crosby, . . .	3 00
For the third best, to John Cummings, . . .	2 00
CORN.—For the best Sweet, twelve ears, to J. Cummings,	4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to S. A. Merrill, . . .	2 00
For the best Field Corn, twenty-five ears, to Mrs. M. T. Goddard, ...	4 00
For the second best, to J. B. Moore, . . .	3 00
For the third best, to A. T. Brown, . . .	2 00

CAULIFLOWERS.—For the best four, to Mrs. M. T. Goddard,	$4 00
For the second best, to J. B. Moore, . . .	3 00
For the third best, to J. Cummings,, . . .	2 00
BRUSSELLS SPROUTS.—For the best two quarts, to Mrs. M. T. Goddard, ...	4 00
CELERY.—For the best four roots, to George Hill, . .	4 00
For the second best, to J. Crosby, ...	3 00
For the third best, to J. Fillebrown, , . .	2 00
TOMATOES.—For the best three varieties, to J. Cummings,	5 00
For the second best, to C. N. Brackett, . . .	4 00
For the third best, to J. J. H. Gregory, . . .	3 00
For the best Arlington, twelve specimens, to J. Cummings, ...	3 00
For the best Boston Market, to J. J. H. Gregory, .	3 00
For the best Canada Victor, to J. Cummings, . .	3 00
For the best Gen. Grant, to C. N. Brackett, . .	3 00
For the best of any other variety, to C. M. Atkinson, for Kelly, ...	3 00
For the best twenty-four specimens, to J. J. H. Gregory, for Paragon, ...	4 00
For the second best, to J. Cummings, for Canada Victor, ...	3 00
For the third best, to J. J. H. Gregory, for Trophy, .	2 00
OKRA.—For the best twenty-four specimens, to Mrs. M. T. Goddard, ...	4 00
For the second best, to A. T. Brown, . . .	3 00
For the third best, to Walter Russell, . . .	2 00
MARTYNIAS.—For the best twenty-four specimens, to George W. Pierce, ...	4 00
For the second best, to Mrs M. T. Goddard, . .	3 00
For the third best, to Walter Russell, . . .	2 00
CRANBERRIES.—For the best half peck, to S. N. Gifford,	4 00
For the second best, to O. M. Holmes, . . .	3 00
For the third best, to C. N. Brackett, . . .	2 00
GREENFLESH MELONS.—For the best four specimens, to George W. Pierce, ...	4 00
For the second best, to Edward Lawrence, . .	3 00
MUSKMELONS.—For the best four specimens, to S. A. Merrill, ...	4 00
WATERMELONS.—For the best pair, to Edward Sumner, .	4 00

For the second best, to Samuel Pratt, . . . $3 00
For the third best, to Samuel Hartwell, . . . 2 00
LIMA BEANS.—For the best two quarts, to C. M. Atkinson, 4 00
For the second best, to B. G. Smith, . . . 3 00
For the third best, to Josiah Crosby, . . . 2 00
PARSNIPS.—For the best twelve, to Walter Russell, . 4 00
For the second best, to W. W. Rawson, . . . 3 00
For the third best, to Josiah Crosby, . . . 2 00
POTATOES.—For the best four varieties, to Walter Russell, 6 00
For the second best, to Mrs. M. T. Goddard, . . 5 00
For the third best, to J. Cummings, . . . 4 00
For the best peck of Bresee's Prolific, to J. Cummings, 3 00
For the best Brownell's Beauty, to J. Cummings, . 3 00
For the best Early Rose, to Mrs. M. T. Goddard, . 3 00
For the best Jackson White, to C. N. Brackett, . . 3 00
For the best Snow Flake, to Walter Russell, . . 3 00
For the best of any other variety, to J. Cummings, for Eureka, ... 3 00
SALSIFY.—For the best twelve specimens, to W. A. Crafts, 4 00
For the second best, to W. Russell, . . . 3 00
For the third best, to George W. Pierce, . . 2 00
SQUASHES.—For the best Canada, four specimens, to Josiah Pratt, ... 4 00
For the second best, to Walter Russell, . . . 3 00
For the third best, to Mrs. M. T. Goddard, . . 2 00
For the best Hubbard, to J. J. H. Gregory, . . 4 00
For the second best, to George Hill, . . . 3 00
For the third best, to Seth W. Hathaway, . . 2 00
For the best Marblehead, to J. J. H. Gregory, . . 4 00
For the second best, to Seth W. Hathaway, . . 3 00
For the third best, to J. Cummings, . . . 2 00
For the best Marrow, to George Hill, ... 4 00
For the second best, to J. Cummings, . . . 3 00
For the third best, to John Fillebrown, . . . 2 00
For the best Turban, to J. Cummings, . . . 4 00
For the second best, to John B. Moore, . . . 3 00
For the third best, to Seth W. Hathaway, . . 2 00
For the largest and best Mammoth, not less than 100 lbs., the Society's Bronze Medal, to Anthony Hatch.
TURNIPS.—For the best twelve specimens, to J. Fillebrown, 3 00

For the second best, to W. Russell, . . .	$2 00
For the third best, to Anthony Hatch, . . .	1 00
For the best Swedish Turnips, twelve specimens, to Mrs. M. T. Goddard, ...	3 00
For the second best, to A. T. Brown, . . .	2 00
For the third best, to J. Cummings, . . .	1 00
CABBAGES.—For the best Drumhead, three specimens, to Seth W. Hathaway, ...	4 00
For the second best, to J. Cummings, . . .	3 00
For the third best, to Mrs. M. T. Goddard, . .	2 00
For the best single specimen, to J. Cummings, . .	3 00
For the best Red, to George F. Stone, . . .	4 00
For the second best, to Anthony Hatch, . . .	3 00
For the third best, to J. Cummings, . . .	2 00
For the best Savoy, to J. Cummings, ...	4 00
For the second best, to S. A. Merrill, . . .	3 00
For the third best, to Mrs. M. T. Goddard, . .	2 00
HORSERADISH.—For the best six roots, to W. W. Rawson,	4 00
For the second best, to John Fillebrown, . .	3 00
For the third best, to Walter Russell, . . .	2 00
PEPPERS.—For the best peck, to C. N. Brackett, . .	4 00
For the second best, to Charles Stearns, . . .	3 00
For the third best, to George F. Stone, . . .	2 00
ONIONS.—For the best peck, of any variety, to Edward Sumner, ...	4 00
For the second best, to J. B. Moore, . . .	3 00
For the third best, to George W. Pierce, . .	2 00
For the best three varieties, one peck each, to J. J. H. Gregory, ...	5 00
For the second best, to J. Cummings, . . .	4 00
For the third best, to Josiah Crosby, . . .	3 00
EGG PLANTS.—For the best Black Pekin, four specimens, to Josiah Crosby, ...	4 00
For the second best, to George W. Pierce, . .	3 00
For the best Large Purple, to George Hill, . . .	4 00
For the second best, to W. W. Rawson, . . .	3 00
For the third best, to Walter Russell, . . .	2 00
PUMPKINS. — For the best four specimens, not less than twenty pounds each, to A. T. Brown, . . .	3 00
For the second best, to W. W. Rawson, . . .	2 00
ENDIVE.—For the best four specimens, to Walter Russell,	4 00

Gratuities: —

To C. E. Richardson, for Squashes,	$1 00
W. P. Walker, for collection of Squashes,	1 00
Anthony Hatch, for Pumpkins,	1 00
Josiah Newhall, for collection of Gourds,	1 00
Harry L. Rand, " " " "	1 00
George W. Pierce, for Texan Egg Plant,	1 00
Samuel G. Stone, for Lima Beans,	1 00
George W. Pierce, for Onions,	1 00
S. A. Merrill, for collection,	4 00
W. Russell, " " of Lettuce,	1 00
W. W. Parsons, for Cranberries,	1 00
E. H. Hitchings, for Barberries,	1 00

OCTOBER 7.

CAULIFLOWERS. — For the best four, to J. Cummings,	4 00
For the second best, to J. B. Moore,	3 00
CELERY. — For the best four roots, to Josiah Crosby,	4 00
For the second best, to John Fillebrown,	3 00
For the third best, to C. W. Chamberlain,	2 00
CABBAGES. — For the best Drumhead, three specimens, to J. Cummings,	4 00
For the best Red, to J. Cummings,	4 00
For the second best, to Anthony Hatch,	3 00
For the best Savoy, to J. Cummings,	4 00
For the second best, to C. M. Atkinson,	3 00
SALSIFY. — For the best twelve specimens, to G. W. Pierce,	4 00
For the second best, to W. Russell,	3 00
HORSERADISH. — For the best six roots, to W. Russell,	4 00
For the second best, to J. Fillebrown,	3 00

Gratuities: —

To George Dorr, for Burr's Corn,	2 00
John Cummings, for Hanson Lettuce,	1 00
Samuel G. Stone, for Lima Beans,	1 00
Stiles Frost, for White Wax Beans,	1 00
John Fillebrown, for collection,	3 00
C. E. Grant, " "	1 00

November 4.

Cauliflowers. — For the best four, to Josiah Crosby,	$4 00
For the second best, to J. Cummings,	3 00
Celery. — For the best four roots, to Josiah Crosby,	4 00
Cabbages. — For the best Red, three specimens, to J. Cummings,	4 00
For the best Savoy, to J. Cummings,	4 00

Gratuities: —

To C. M. Atkinson, for collection,	2 00
Josiah Crosby, for Salsify,	1 00

November 11.

Gratuities: —

To Josiah Crosby, for Cauliflowers and Celery,	4 00
C. M. Atkinson, for Cauliflowers and Cabbage,	3 00
C. W. Chamberlain, for Celery,	2 00

The amount awarded to each contributor is as follows:

Alexander Anderson	$4	George Dorr	$2
W. T. Andrews	2	John Fillebrown,	26
C. M. Atkinson	25	D. B. Flint	6
James Bard	10	Stiles Frost	1
H. C. Bowers	1	Charles Garfield	6
C. H. Brackett	7	S. N. Gifford	4
C. N. Brackett	68	Mrs. E. M. Gill	5
A. T. Brown	10	Mrs. Mary T. Goddard	51
A. D. Capen	1	C. E. Grant	24
Miss Sabra Carter	1	J. J. H. Gregory	25
M. W. Chadbourne	17	Samuel Hartwell	26
C. W. Chamberlain	6	Anthony Hatch, Bronze Medal and	8
W. C. Child	18	Seth W. Hathaway	11
James Comley	22	George Hill	67
George Craft	2	E. H. Hitchings	1
W. A. Crafts	4	O. M. Holmes	3
Josiah Crosby	173	Hovey & Co.	6
John Cummings	107	C. D. Kingman	5
C. T. Curtis	3	Edward Lawrence	3
Alexander Dickinson	4		

G. M. Mellen	$9	Walter Russell,	$198
S. A. Merrill	13	B. G. Smith	14
A. S. M'Intosh	1	Charles Stearns	3
John B. Moore	34	George F. Stone	17
Josiah Newhall	1	S. G. Stone	2
W. W. Parsons	1	Edward Sumner	8
George W. Pierce	78	Joseph Tailby	4
Josiah Pratt	4	J. W. Twombly & Son	5
Samuel Pratt	3	W. P. Walker	1
Harry L. Rand	1	L. W. Weston	6
W. W. Rawson	12	N. B. White	2
J. S. Richards	3	E. M. Whitney	1
C. E. Richardson	1	E. W. Wood,	1
George Russell	4	W. K. Wood,	2

Amount appropriated,	$1,200 00
Prizes and Gratuities awarded,	1,180 00
Balance unexpended,	$20 00

REPORT

OF THE

Committee on Gardens,

FOR THE YEAR 1876.

BY JOSEPH H. WOODFORD, CHAIRMAN.

The Garden Committee, in making their report, would call the attention of members to the fact that active competition has a great deal to do with the success of any society, but more particularly in such an one as ours; and it is desirable that more members enter places for the inspection of the Committee, thereby fostering the interests of the Society and stimulating your Committee to greater exertions.

EDWARD S. RAND, JR.'S GREENHOUSE AND GRAPERY.

The first visit this year was to Glen Ridge, in May, to inspect Edward S. Rand, Jr.'s Greenhouse and Grapery. The Greenhouse is one hundred and thirty-five feet by twenty, and is divided into four compartments to accommodate the plants from various countries. The principal attraction at this time was the Stove, which was well filled with costly orchids, handsomely interspersed with ferns, giving the house a much more elegant appearance than either would alone. Some of the most beautiful of the orchids in bloom were *Cattleyas* of various species, *Oncidiums*, *Vandas*, *Dendrobiums*, etc. The other compartments of the house were well filled with plants, generally in good health and very well grown, especially the *Agaves* and other succulents, which were in robust health and presented a very fine appearance.

On the second visit to Glen Ridge, which occurred in September, your Committee noticed a much smaller collection of orchids and a less amount of bloom; but the house was very clean and neat, and the other plants were looking finely, but more particularly the

Agaves, some of which were used to decorate the grounds about the mansion.

We award Mr. Rand the second prize of thirty dollars for his Greenhouse.

Your Committee also in May visited Mr. Rand's Cold Grapery. This consists of a house one hundred feet by twenty-five, with curvilinear roof, having no inside supports, and well filled with sixty vines of the best kinds of foreign Grapes. At this visit Robert Watt was training the vines, which gave promise of an abundant crop of grapes late in the season. On our second visit, which occurred September 7th, the expectations of the spring were realized, for at this time we were regaled with well ripened grapes of a dozen or more kinds. The bunches were not extra large, but were well ripened and of delicious flavor.

We award Mr. Rand the first prize of fifty dollars, for his Grapery.

John B. Moore's Greenhouse.

In June your Committee visited John B. Moore's Greenhouses at Concord, and also in September. On both visits the Committee were particularly struck with the neatness of the houses and the cleanness of the plants. The plants grown by Mr. Moore being almost entirely for sale or for producing flowers for the florist, were noticeable as being the best varieties for those purposes. They were very thrifty and in handsome foliage, and the net result at the end of the year, from the exhibit, was very gratifying. Mr. Moore's manner of keeping over Azaleas, Hardy Roses, etc., was commended by your Committee, and we cannot do less than to bring it to the attention of the Society. The pots were plunged in coal ashes in cold frames, and kept in robust health by judicious watering and assiduous care. The stove presented a very handsome appearance, being filled with well grown young and thrifty *Caladiums*, *Dracœnas*, *Crotons*, etc., of vigorous growth and splendid foliage, giving evidence of economy in management and general thrift in result.

We award Mr. Moore the first prize of fifty dollars for his Greenhouse.

For the Committee,

J. H. WOODFORD, *Chairman.*

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION.

As the results of the work under the supervision of this Committee appear in the published TRANSACTIONS of the Society, it would seem scarcely necessary to make an annual report. Very briefly, we may say, that the discussions have been maintained with increasing interest. They have been practical in their character, and there can be no doubt that this free interchange of experience by practical men, will prove to be of great value to our members. It seems to your Committee to be desirable to preserve this characteristic; to encourage discussions upon subjects connected with the exhibitions; to draw out the methods of our most successful cultivators, and, in a generous way, to compare notes, with a purpose to mutual help. But, while our main reliance is upon such eminently practical methods as exhibitions, and discussions connected with them, it is also well for us to consider whether we should not, to some extent, seek for help from deeper scientific investigation upon themes connected with our art. We are fully persuaded of the invaluable service which science has rendered to horticulture. Our Society has wealth and position; shall it not, to some extent, become the patron of science, and encourage investigation in directions where information seems most needed? Indirectly, this may be done, by establishing occasional lectures upon scientific subjects, and thus striving to make the Society the channel, through its publications, of disseminating the results of the latest research. All will admit the advantage of keeping abreast with modern discovery, in every branch of our art; and, if we add to this consideration the honor and increased influence which will accrue to the Society by thus publishing knowledge in our department, we shall agree that we can scarcely pay too high a price for the attainment of this end. It will therefore be the aim of the Committee during the coming year, to secure an occasional lecture, more strictly

scientific than we have had in the past. And we trust and believe that the funds of the Society, to the moderate extent which may be needed for this purpose, will not be wanting. At the present time your Committee ask for the appropriation of $250 for the coming year, to meet the expense of prizes and other incidentals.

The following prizes have been awarded for Essays, which will be read during the coming season:

For the best Essay upon the Culture of the Squash and Melon, with a list of the best varieties, to J. W. Pierce, the prize of	$25 00
For the best Essay upon the Improvement and Ornamentation of Suburban and Country Roads, to Daniel Denison Slade, the prize of	25 00

For the Committee,

WILLIAM C. STRONG, *Chairman.*

REPORT OF THE SECRETARY.

The duties of the Secretary during the past year have been so similar to those described in my last report, as Editor, that any particular mention of them would be but a repetition of that. The chief difference has been the addition of the duties of Recording Secretary and of Secretary of the Executive Committee. As Secretary of the Committee on exhibiting Massachusetts Fruits at the Centennial Exposition, much time was consumed in making the preliminary arrangements, and in answering inquiries concerning them, both personally and by letter, as well as in arranging (with the other members of the Committee) the fruit in the Exposition.

When my last report was made, I hoped and expected that by this time I should be able to report the completion of the History of the Society. The review of all the exhibitions of the Society from the beginning—in some respects the most important part of the history, as describing the chief means by which the Society has directly promoted the advancement of horticulture—has occupied more time than was anticipated. This portion of the history has been divided into three parts—the first from the foundation of the Society in 1829, to the occupation of the first Horticultural Hall in 1845; the second from that time to the building of the present Hall in 1865; and the third from that time onward. The history of the first two of these periods has been completed, but for the reasons before mentioned, and the many calls on my time, my hope of completing the whole has been disappointed.

ROBERT MANNING, *Secretary.*

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS,

For the Year 1876.

The Chairman of the Committee of Arrangements, agreeably to a vote of the Society, passed at the regular meeting in January, 1876, would respectfully submit the following report.

For a number of years past a report has not been made, owing, perhaps, to the reports of the various committees, required by the By-Laws, seeming to obviate the necessity of one from the Committee of Arrangements, supplying as they do, a record of all the essential doings of the last named committee, with the exception of minor details, such as printing tickets, advertising, engaging music, and approving bills contracted for necessities required for the exhibitions. The Committee is divided into Sub-Committees, consisting of members of the Fruit, Flower, and Vegetable Committees, who have charge of the arrangement of the tables for the exhibition of the Fruits, Flowers, and Vegetables, and to whose careful supervision is owing the success of the Rose Show in June, and the Annual Exhibition in September.

The Committee has been called together at such times during the year as was deemed necessary, to consult upon matters of business concerning the exhibitions, so that they might prove successful, and worthy of the Society. The meetings have at all times been well attended; every member has had the interests of the Society fully at heart in all the discussions of such subjects as they have been called together to act upon, and it has been no fault of theirs if the exhibitions have not proved so remunerative as we could have wished. In point of excellence they have seldom, if ever, been surpassed. The Rose Exhibition in June was universally admitted to be far superior to any previous one, and was free to the public.

The Annual Exhibition, notwithstanding the extremely hot, dry weather of Summer, and other drawbacks discouraging to the cultivator, was one of which the Society may justly feel proud. It is not necessary to enter into its details here, as they will be found in the full and able reports of the Fruit, Flower, and Vegetable Committees. It was opened on the 19th of September, with an admission fee of twenty-five cents, and was continued four days. The weather was stormy for most of the time, notwithstanding which the attendance was very large, although the receipts were small, amounting to only $450.70, the complimentary tickets having, as usual, been pretty freely distributed to members and such persons as the Committee thought best to send them to. No pains were spared on the part of the Committee to render it attractive; as proof that they succeeded in doing so, all who attended will attest its having been one of the best arranged and most attractive exhibitions ever held by the Society. We wish the receipts could have been larger, and an interest taken out of the Society, such as has been shown in other cities, where the general public seem to be more appreciative of the labors of the horticulturist than in Boston. One reason for this lack of enthusiasm is, perhaps, our excellent weekly exhibitions, which have always been open to the public free of expense. One would think that these generous efforts to promote the cause of horticulture, by offering such delightful and interesting displays of Fruits, Flowers, and Vegetables, every Saturday throughout the season, would awaken an interest in the public for the welfare of the Society, lively and deep enough to make it liberal once in the year, thereby cheering the hearts and strengthening the hands of those who have devoted their time and energies to produce exhibitions so attractive, and which never fail to reward with pleasure and instruction those who visit them.

For the Committee,

C. H. B. BRECK, *Chairman.*

REPORT

OF THE

LIBRARY COMMITTEE.

By EDWARD S. RAND, Jr., Chairman.

The steady growth of the Library has continued during the past year. Many new and valuable books have been added, some of which have for years been on the list of *desiderata.*

The creation of a horticultural library is not the work of a few years, nor can it be accomplished without a liberal expenditure of money. For many years your Committee have labored assiduously to make the Library of this Society the most complete horticultural library in the country. It has been a work requiring untiring attention, a knowledge of the value of books, and a constant acquaintance with the sales of libraries on both sides of the Atlantic.

Botanical books are printed in small editions, soon go out of print, and are absorbed by collections, and then rarely come to sale; thus, the watching of the market to secure choice books as they may, from time to time, be offered for sale, is a most important duty of the Committee.

From the small beginnings of the year 1856, when the Library was contained in one case, and was composed of books of but little value, up to 1869, the growth of the Library, though steady, was not rapid. During those years the funds at the disposal of the Committee were not sufficiently large to allow the purchase of very expensive works, and it was deemed advisable to add to the library cultural works, few of which were, individually, of great pecuniary value. By the addition of these, however, the usefulness of the library was greatly increased, and each year the members of the Society more fully appreciated and availed themselves of its advantages.

In the year 1869, by the liberality of Ex-President Josiah Stickney, whose decease the Society has, the past year, been called upon to mourn, the funds in the hands of the Committee were so increased as to admit of the purchase, from time to time, of many rare and very expensive works. The possession of such volumes as Sibthorp's Flora Græca, Flora Danica, Redouté's Liliacées, Bateman's Orchidaceæ of Mexico and Guatemala, Bury's Hexandrian Plants, Wallich's Plantæ Asiaticæ, Roxburgh's Flora Indica, and Roxburgh's Coromandel Plants, is, of itself, sufficient to give importance to the library. And when we look over the Catalogue and see the titles of hundreds of books, of which probably the only copy in this country is found in our library, the Society has great cause for congratulation. Already, ours is the most complete and valuable horticultural library in the country, and the past year has added largely to its treasures, as will be seen by a perusal of the lists annexed to this report.

Your Committee regret that they have been able to add so few works on Pomology. There are comparatively few illustrated works on fruit; all that were attainable have been purchased, and all cultural works on this subject are upon the library shelves. Your Committee would ask members of the Society to call attention to any deficiency of the library in this branch of horticulture; or, in fact, upon any subject connected with horticulture.

The want of room for the library is seriously felt; and, although additional space has been provided, it cannot be many years before a reconstruction of the library room will be imperatively demanded. Accommodations are greatly needed for pamphlets, of which the library contains a very valuable collection, but which, in their present condition are not available for ready reference. The want of a catalogue, arranged on slips, as in use in all large libraries, is beginning to be felt.

Your Committee would report that the appropriation of the Society has been chiefly expended for periodicals and binding, and would ask an appropriation of the same amount $300) for the year 1877. The income of the Stickney Fund has been wholly expended in the purchase of rare books. Some valuable works have been presented to the library, among which your Committee would especially mention two copies of Les Promenades de Paris, par A. Alphand, Paris, 1868, a magnificent work, respectively given by William Gray, Jr., and Francis L. Lee.

For full information as to the volumes presented, the additions to the library during the past year, and the periodicals subscribed for by the Society, reference may be had to the lists accompanying this report. Your Committee refer with great pleasure to the assistance that has been derived from the constant attention of the Librarian, Edwin W. Buswell, to all matters appertaining to the library. It is owing to his uniform courtesy that the library is made so accessible and useful to the members, and his constant attention to the wants of those visiting the library room in search of botanical information conduces much to the usefulness of the Society.

LIBRARY ACCESSIONS IN 1876.

Books Purchased.

Duhamel du Monceau. Traité des Arbres et Arbustes. 2d edition. 7 vols. folio, 488 colored plates. Paris: 1801–19.

St. Hilaire, Jaume. La Flore et la Pomone Françaises. 6 vols. royal 4to., 544 colored plates. Paris: 1828–33.

Pfeiffer, L. Nomenclator Botanicus. 4 vols. 8vo. Cassellis: 1873–4.

Lawson's Pinetum Britannicum. Folio. Nos. 34 and 35, to complete the work.

Boott, Francis, M. D. Illustrations of the Genus Carex. 4 vols. folio, 600 plates. London: 1858–67.

Tulasne, Louis-René and Charles. Fungi Hypogæi. Histoire et Monographie des Champignons Hypogés. Folio, 21 plates, partly colored. Paris: 1851.

Endlicher, Stephanus. Genera Plantarum. Royal 8vo. Vindobonæ: 1836–40.

——— ———. Synopsis Coniferarum. 8vo. Sangalli: 1847.

United States and Mexican Boundary Survey. 3 vols. 4to. Many plates. Washington: 1857–59.

Flückiger, Friedrich A. and Daniel Hanbury. Pharmacographia: A History of the principal Drugs of Vegetable Origin in Great Britain and British India. 8vo. London: 1874.

Hassard, Annie. Floral Decorations for the Dwelling-house. 12mo. New York: 1876.

Say, Thomas. American Entomology. Vol. 1, to complete the set. 8vo., 18 colored plates. Philadelphia: 1824.

Sullivant, William S. Icones Muscorum: Supplement. Royal 8vo., 81 plates. Cambridge, Mass., and London: 1874.

Mohr, Frederick. The Grape Vine, its Management, etc. Translated by Charles Siedhof. 12mo. New York: 1867.

Bentham, George, and J. D. Hooker. Genera Plantarum ad Exemplaria imprimis in Herbariis Kewensibus servata definita. Vols. 1 and 2, royal 8vo. London: 1862–1876.

——— ——. Review of the Order of Hydrophylleæ. 4to. pamphlet, plate. 1834.

——— ——. On the Heliamphora Nutans. 4to. pamphlet. 1840.

——— ——. On African Anonaceæ. 4to. pamphlet, 5 plates. 1862.

Brewer, W. H., Sereno Watson, and Asa Gray. Botany of California. Vol. 1. Uniform with the publications of the Geological Survey of California. 4to. Cambridge: 1876.

Koch, K. Dendrologie. 2 vols. 8vo. Erlangen: 1869–1872.

Beddome, R. H. Icones Plantarum Indiæ Orientalis, or New and Rare Plants from Southern India and Ceylon. Vol. 1, 4to., 300 colored plates. Madras: 1874.

——— — —. Ferns of Southern India. 4to., 271 plates. Madras: 1873.

Lettsom, J. C. Natural History of the Tea Tree. 4to. London: 1799.

Pallas, P. S. Illustrationes Plantarum. Folio, 59 colored plates. Lipsiae: 1803.

Masson, F. Stapeliæ Novæ. 4to., 41 colored plates. London: 1796.

Lunan, John. Hortus Jamaicensis. 2 vols. 4to. St. Jago de la Vega: 1814.

Oliver, Daniel. Illustrations of the Vegetable Kingdom. Oblong 4to., 109 plates. London: 1874.

Decaisne, J. Le Jardin Fruitier du Museum. Parts 101–121, in continuation. Imperial 8vo. Paris.

Hooker, J. D. Flora of British India. Vol. 1, 8vo. London: 1875.

Saunders, Wilson W. Refugium Botanicum. Vol. 1, Parts 1–3; Vol. 2, Part 1; Vol. 3, Parts 1–3; Vol. 4, Parts 1–3; Vol. 5, Parts 1, 2; "all published." 8vo., many plates, partly colored. London: 1868–72.

Seeman, Berthold. Journal of Botany, British and Foreign. 12 vols. 8vo. London: 1863–74.

Cavanilles, Ant. Josephus. Icones et Descriptiones Plantarum in Hispania Crescunt. 6 vols. folio, 600 plates. Matriti: 1791–1801.

Trew, C. J., G. D. Ehret and B. C. Vogel. Plantæ Selectæ Londini in Hortis. 100 colored plates. Nuremberg: 1750–73. Also, Plantæ et Papiliones rariores: 18 colored plates, by G. D. Ehret. Heidelberg: 1748. 1 vol. folio.

Catesby, Mark. Natural History of Carolina, Florida, and the Bahama Islands, with descriptions in English and French. 2 vols., folio, 220 colored plates. London: 1771.

Rand, Edward S., Jr. Orchids, a description of the Species and Varieties grown at Glen Ridge, with lists of other desirable kinds. 8vo. New York: 1876.

Roosevelt, Robert B. Five Acres Too Much. 12mo. New York: 1869.

Johnson, Joseph Forsyth. The Natural Principles of Landscape Gardening. Royal 8vo., 10 plates. Belfast: 1874.

Baltet, Charles. The Art of Grafting and Budding. Small 8vo., many wood-cuts. London: 1873.

Alcock, Randal H. Botanical Names for English Readers. 8vo. London: 1876.

Descourtilz, M. E. Flore Pittoresque et Médicale des Antilles, etc. 8 vols. 8vo., 600 colored plates. Paris: 1827–33.

Baillon, H. Histoire des Plantes. 8vo. Parts 48–53, in continuation.

Candolle, Alph. de. Géographie Botanique. 2 vols., 8vo. Paris et Genève: 1855.

Salm-Dyck, Jos. de. Monographia generum Aloes et Mesembryanthemi. 3 vols. 4to., many plates. Bonnæ: 1836–63.

——— ——— —. Hortus Dyckensis. 8vo., 3 plates. Dusseldorf: 1834.

——— ——— —. Cactæ in Horto Dyckensi cultæ anno 1849. 8vo. Bonnæ: 1850.

Jacquin, Nicolaus Josephus. Plantarum Rariorum Horte Cæsarei Schoenbrunnensis. 4 vols. in 3, folio, 500 colored plates. Viennæ: 1797–1804.

——— ——— ———. Genitalia Asclepiadearum Controversa. Small 8vo. Viennæ: 1811.

Cooke, M. C. A. Manual of Structural Botany. 16mo., 215 wood cuts. London: 1870.

Green, Francis H., and Joseph W. Congdon. Analytical Class Book of Botany. Small 4to., many wood-cuts. New York and London: 1859.

United States Exploring Expedition under Charles Wilkes in 1838–1842. Vol. 15. The Geographical Distribution of Animals and Plants, by Charles Pickering, M. D. Part 1.—History of the Introduction of Animals and Plants. Royal 4to. Boston and London: 1863.

Pickering, Charles. The Geographical Distribution of Animals and Plants. Part 2.—Plants in their Wild State. Royal 4to. Salem: 1876.

Journal of the Royal Agricultural Society for 1876. Second Series, vol. 12, 8vo. London: 1876.

Du Breuil, A. Vineyard Culture, with notes by J. A. Warder. 12mo., 144 wood-cuts. Cincinnati: 1867.

Morren, Charles and Édouard. Belgique Horticole. 25 vols. 8vo., many colored and other plates. Liege: 1851–75. Still publishing.

Darwin, Charles. The Movements and Habits of Climbing Plants. 12mo. New York: 1876.

Transactions of the Academy of Science of St. Louis. Vols. 1 and 2, 8vo., plates. St. Louis: 1857–68.

Fraser, Hugh. Handy Book of Ornamental Conifers, Rhododendrons, etc. Small 8vo. London: 1875.

Brown, James. The Forester. 2d ed., enlarged. 8vo. London: 1851.

Sinclair, George. Hortus Gramineus Woburnensis. 3d ed., large 8vo., many colored plates. London: 1826.

Brandis, Dietrich. The Forest Flora of North-west and Central India. 8vo. London: 1874.

Baker, J. G. Elementary Lessons in Botanical Geography. 12mo. London: 1875.

Murray, Andrew. The Pines and Firs of Japan. 8vo., 224 wood-cuts. London: 1863.

Just, Dr. Leopold. Botanischer Jahresbericht. Zweiter Jahrgang (1874), Zweite Abtheilung. 8vo. Berlin: 1875.

Hooker, J. D. Flora of Australia, an Introductory Essay to the Flora of Tasmania. 4to. pamphlet. London: 1859.

Lubbock, Sir John. On the Origin and Metamorphoses of Insects. Small 8vo., many wood-cuts. (Nature Series.) London: 1874.

Lubbock, Sir John. On British Wild Flowers, considered in relation to Insects. Small 8vo., many wood-cuts. (Nature Series.) London: 1875.

Smith, C. Roach. The Rural Life of Shakspeare as illustrated by his works. 8vo. pamphlet, 2d ed. London: 1874.

Horsfield, Thomas. J. J. Bennett and R. Brown. Plantæ Javanicæ rariores. Folio, 50 colored plates. London: 1838.

Hortus Collinsonianus. An account of the Plants cultivated by the late Peter Collinson. 8 vo. pamphlet. Swansea: 1843.

Hogg, Robert. The Dahlia. 8vo. pamphlet, 9 colored plates. London: 1853.

Balfour, Edward. The Influence of Trees in producing rain, etc. 8vo. pamphlet, pp. 401–474. [Madras: 1849?]

Brooke, James & Co. The Fairfield Orchids. 8vo. London: 1872.

Zuccarini, Dr., Prof. Grisebach, Carl Nägeli, and H. F. Link. Reports and Papers on Botany. 8vo., 7 plates. Printed for the Ray Society. London: 1846.

Pinaceæ: a Handbook of the Firs and Pines. By "Johannes Senilis." 8vo. London: 1866.

Reichenbach, Prof. H. G. Enumeration of Orchids collected in the neighborhood of Moulmein. 4to. pamphlet, 6 plates. 1873.

Memoirs of the Philadelphia Society for Promoting Agriculture. 5 vols. 8vo. Philadelphia: 1815–1826.

Swartz, Olai. Synopsis Filicum. Adjectis Lycopodineis. 8vo., 5 plates. Kiliae: 1806.

Pinetum Woburnense: a Catalogue of Coniferous Plants in the collection of the Duke of Bedford at Woburn Abbey. Imperial 8 vo., 67 colored plates. 1839. [Not published.]

Brownius, Robertus. Prodromus Florae Novae-Hollandiae et insulae Van-Diemen. Small 4to. Norimbergae: 1827.

Dunal, Mich. Félix. Histoire Naturelle, Médicale, et Économique des Solanum, etc. 4to., 26 plates. Paris: 1813.

Hussey, Mrs. T. J. Illustrations of British Mycology. 4to., 90 colored plates. London: 1847. Second series, 50 colored plates. London: 1855.

Lindley, John. The Genera and Species of Orchideous Plants, with drawings by Francis Bauer. 4to., 24 colored and 10 uncolored plates. London: 1830–38.

Lindley, John. Sertum Orchidaceum, a Wreath of the most beautiful Orchidaceous Flowers. Folio, 50 colored plates. London: 1838.

Martius, Carol. Frid. Phil. de. Historia Naturalis Palmarum. 2 vols. large folio. Vol. 1, text; vol. 2, 238 colored plates. Lipsiae: 1823–1848.

Bentley, Robert, and Henry Trimen. Medicinal Plants. 15 parts, 8vo., colored plates. London: 1875–6. To be completed.

Lea, Rev. William. Small Farms for Fruit Growing. 16mo. London: 1872.

Scott, John. The Orchardist, or Catalogue of Fruits cultivated at Merriott, Somerset. 8vo. London: no date.

Coultas, Harland. What may be learned from a Tree. 8vo. New York and London: 1860.

The following named books have been ordered, but were not received at the time of printing this report:

Balfour. Timber Trees, Timber, and Fancy Woods; also, The Forests of India and of Eastern and Southern Asia.

Forbes. Hortus Ericaceus Woburnensis.

Bentham. New species of Tropical Leguminosæ.

Lindley. List of the Orchidaceous Plants of East Cuba.

———. Contributions to the Orchidology of India.

Tracts: on Transplanting Evergreens and Large Deciduous Trees, by Stuart; Canker in Fruit Trees; Diseases of Plants; Use of Salt as a Manure, etc, bound in one volume.

Transactions of the Scottish Arboricultural Society of Edinburgh.

Williams' Stove and Greenhouse Plants. New edition.

Bosson. Les Plantes Bulbeuses.

Piper, R. U. The Trees of America.

Fowler, J. H. Orange Culture.

Morren, Prof. Directory of Botanists.

Hooker, W. J. Jungermanniæ.

Books and Pamphlets Presented.

Alphand, A. Les Promenades de Paris: Bois de Boulogne et de Vincennes, Champs Elysées, Parcs, Squares, Boulevards. Places Plantées. 2 vols., large folio, 487 wood cuts, 80 steel plates, and 23 chromoliths. Paris: 1868–72. William Gray, Jr.

Another copy from Francis L. Lee.

Major, Joshua. The Theory and Practice of Landscape Gardening. 4to., plates and cuts. London: 1852. E. H. Hitchings.

Busby, James. Grapes and Wine. A Visit to the principal Vineyards of Spain and France. 12mo. New York: 1848. E. H. Hitchings.

Bulletin de la Société Centrale d' Horticulture du Départment de la Seine-Inferieur. Tome 18, Parts 1 and 2, 8vo. pamphlets. Rouen: 1876. The Society.

Transactions of the Worcester County Horticultural Society for 1875. 8vo. pamphlet. John C. Newton, Librarian and Treasurer.

Proceedings of the New Jersey State Horticultural Society at its Annual Meeting held in New Brunswick, January 20th and 21st, 1876. 8vo. pamphlet. E. Williams, Recording Secretary.

Transactions of the Wisconsin State Horticultural Society. Vol. 6, 8vo. 1876. F. W. Case, Secretary.

Downing, Charles. Second Appendix to the Second Revised Edition of the Fruits and Fruit Trees of America. 8vo. pamphlet. New York: 1876. The Author.

Bivort, Alexander. Les Fruits du Jardin Van Mons. 8vo. Bruxelles: 1868. The Author.

Proceedings of the Fifteenth Session of the American Pomological Society held in Chicago, Ill., September, 1875. 4to. pamphlet. 4 copies. Marshall P. Wilder, President.

Third Annual Report of the Maine State Pomological Society for 1875. 8vo. pamphlet. George B. Sawyer, Secretary.

Report of the Pennsylvania Fruit Growers' Society for 1875. 8vo. pamphlet. E. B. Engle, Secretary.

Fruit List of the Province of Quebec, by the Fruit Growers' Association of Abbotsford. 8vo. pamphlet. J. D. Gibb.

First Report of the Fruit Committee of the Montreal Agricultural and Horticultural Society, June, 1876. The Society.

Thirteenth, Fourteenth, Fifteenth, and Sixteenth Annual Reports of the Baltimore Park Commission. 4 pamphlets, 8vo., with map. Baltimore: 1873–76. The Commission.

Report on the Establishment of a Public Park. 8vo. pamphlet. Boston: 1874. William Gray, Jr., Commissioner.

First, Second, and Third Reports of the Board of Commissioners of the Department of Parks for the City of Boston. 8vo., with maps. 1876. William Gray, Jr., Commissioner.

Report of the South Park Commissioners, Chicago, for the year 1875.

Acts of the Assembly, etc., relating to South Park, 1869, 1875.

Sidway, L. B., Chairman of the Horticultural Department of South Park Commission. Report for five years ending March 31st, 1876. 3 pamphlets, 8vo. H. W. Harmon, Secretary of the Commission.

Second Annual Report of the Commissioners of Central Park, New York. 1859.

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Ninth Annual Report of the Connecticut Board of Agriculture, 1875–6. 8vo. T. S. Gold, Secretary.

Fourth Annual Report of the State Board of Agriculture of Kansas for 1875. 8vo. Alfred Gray, Secretary.

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Transactions of the Hingham Agricultural and Horticultural Society for the year 1875. 8vo. pamphlet. Fearing Burr, Corresponding Secretary.

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Thirteenth Annual Report of the Massachusetts Agricultural College. 8vo. pamphlet. W. S. Clark, President.

Report of the Curators of the University of Missouri, etc., for 1875. 8vo. pamphlet. G. C. Swallow.

Report of the New Hampshire College of Agriculture and the Mechanic Arts, for 1875.

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Balbiani, M. Sur la Parthénogénèse du Phylloxera. 3 pamphlets. 4to. Paris: 1876. Asa Gray.

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Wilder, Marshall P., President. Address at the Annual Meeting of the New England Historic Genealogical Society, January 5, 1876. 8vo. pamphlet. Boston: 1876. The Author.

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Report of the Astor Library for 1876. 8vo. pamphlet. S. B. Ruggles, Secretary.

Periodicals Taken.

English.—Gardener's Chronicle.
" Magazine.
Journal of Horticulture and Cottage Gardener.
The Garden.
Curtis' Botanical Magazine.
Floral Magazine.
Florist and Pomologist.
Floral World.
Journal of the Linnean Society.
Journal of Botany.
Farmer's Magazine.
Country Gentleman's Magazine.
Journal of the Royal Agricultural Society.

French. —Révue Horticole.

Belgian.—Illustration Horticole.
Flore des Serres.
Belgique Horticole.

American.—California Horticulturist.
American Agriculturist.
Country Gentleman.
Rural Carolinian.
American Farmer.
Silliman's Journal.
American Naturalist.

Periodicals Presented.

New England Farmer.
Massachusetts Ploughman.
Boston Cultivator.
Scientific Farmer.
Gardener's Monthly.
American Rural Home.
Maine Farmer.
Canada Farmer.
Prairie Farmer.
Maryland Farmer.
Rural Southerner.
Semi-Tropical.

Western Agriculturist.
Center Union Agriculturist.
Monthly Report of the Department of Agriculture.
Bulletin of the Essex Institute.
Bulletin of the Torrey Botanical Club.
Patent Right Gazette.
New York Semi-Weekly Tribune.
Rhode Island Press.
Boston Evening Transcript.
Boston Daily Globe.
Daily Evening Traveller.
Boston Morning Journal.
The Nursery.
The Cottage Hearth.

TREASURER'S REPORT,

FOR THE YEAR 1876.

ITEMS OF INCOME.

Balance of Cash on hand,	$416 64
Received of William Gray, Jr., to pay prizes for 1875,	85 00
" from Rent of Stores,	12,433 28
" " " Halls,	5,563 60
" " Admissions and Assessments,	1,332 00
Gross Receipts of Annual Exhibition,	450 75
Borrowed on call,	11,000 00
Sundries,	30 50
	$31,311 77

ITEMS OF EXPENDITURE.

Salaries of Treasurer, Secretary, and Chairmen of Committees,	$3,400 00	
Library Accessions,	765 80	
Heating and Water, less paid by tenants,	477 52	
Stationery, Postage, and Printing,	1,632 24	
Alterations and Repairs on Building,	550 78	
Gas,	987 04	
New Furniture and Repairs,	315 90	
Expenses of Annual Exhibition,	956 13	
Expenses of Rose Show,	73 15	
Taxes,	3,429 00	
Interest,	3,087 08	
Insurance,	1,517 25	
Bust of President Parkman,	200 00	
Portrait of Dr. Bigelow,	580 00	
Expenses of Centennial Exhibition,	340 81	
Balance of Prizes for 1875,	4,733 50	
Deposited to pay Prizes of 1876,	6,000 00	
Incidental Expenses,	2,035 68	
Balance carried to new account,	229 89	
		$31,311 77

BOSTON, January 5, 1877.

We have examined the foregoing account and found it correct, and the balance of cash on hand, two hundred and twenty-nine dollars and eighty-nine cents, as stated.

[Signed] C. O. WHITMORE, H. H. HUNNEWELL, B. P. CHENEY, } *Finance Committee.*

ASSETS AND LIABILITIES.

ASSETS.

Real Estate, Furniture, and Exhibition Ware, costing		$256,415 51
Add for Rose Boxes and Card Clasps,		170 05
		$256,585 56
Library, last year, ...	$14,795 60	
Paid this year, ...	765 80	
		15,561 40
Bonds of C., B. & Q. R. R., par value, . . .		1,500 00
Total, ...		$273,646 96

LIABILITIES.

Mortgage debt at 5½ per cent., payable September, 1883, ...	$60,000 00	
Loan without interest, payable to Harvard College in 1899, ...	12,000 00	
Floating Debt, ...	11,000 00	
		$83,000 00
Balance of assets over liabilities, . .		$190,646 96

By last year's Report our membership numbered . .				1,035
Of these were Life Members, .		577		
Added by election, . . .		18		
Added by commutation, . .		2		
		597		
Deceased, ...		10		
			587	
Annual Members,		482		
Added,		11		
		493		
Commuted, . . .	2			
Deceased, . . .	10			
Discontinued for non-payment,	55			
Withdrawn, . . .	5			
		72		
			421	
				1,008

Income from the above:

18 Life, ...	$540 00
11 Annual, ...	110 00
2 Commuted, . . .	40 00
321 Subscriptions, . . .	642 00
	$1,332 00

The foregoing requires a few words of explanation. The hard times so long dreaded, culminating in a reduction of rents, and no income from Mount Auburn Cemetery, have lessened our resources, while our expenditures have not been correspondingly reduced. We have not only paid a balance of over five thousand dollars of prizes awarded in 1875, but have fully provided for those of this year, necessitating a loan on call of eleven thousand dollars. I believe this to be only a temporary condition of affairs. Present indications point to a better financial condition in the coming year.

The causes before named have also affected our membership. A larger number than ever before of our subscription members have been discontinued for non-payment, and a few have withdrawn honorably. Our ranks are kept full by the addition of life members. So much as Treasurer.

As Librarian and Superintendent, a few words. I would add to

what has been said in the report of the Library Committee, that although the expenditure is not equal to the appropriation, the books purchased to arrive will make that account all right next year. I only wish the library could be made more valuable by more frequent and constant use. It is to-day the best of its kind in the world, but is beneficial only in proportion as it is consulted.

Our stores are as desirable as ever, and our halls have lost nothing of their prestige.

The visitors to our rooms for the use of the library and for mutual intercourse, increase in numbers year by year to a degree truly encouraging. Friends of horticulture abroad will please accept an invitation to make our rooms their headquarters while in this city. Our members, of course, need no invitation.

E. W. BUSWELL, *Treasurer.*

MOUNT AUBURN CEMETERY.

The following accounts between the Society and the Proprietors of the Cemetery of Mount Auburn are printed as presented by the Treasurer of the latter corporation.

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery, for the year ending Dec. 31, 1876.

Cost of filling up and improving land at Mt. Auburn, unsalable or unfit for burial purposes, and expenditure on account of New Receiving Tomb for the year ending Dec. 31, 1876; the Mass. Horticultural Society being charged with their proportion of the same.		
Grading between Althea and Clethra Paths, .	$420 97	
" " Spruce and Mound Avenues, .	223 28	
" near Halcyon Lake, ...	635 69	
" on Fountain Avenue and near Lime, .	1,359 00	
" land on Stone Farm, ...	8,643 65	
Expended on New Receiving Tomb. . . .	9,539 93	
One-quarter of	$20,822 52	$5,205 63
Amount paid Town of Watertown for Taxes and Expenses, ...	594 20	
Amount paid Town of Watertown for permit to use lands for burial purposes, ...	2,500 00	
Amount paid H. W. Paine's bill, services, . .	40 00	
One-quarter of	$3,134 20	783 55
		$5,989 18
Balance brought forward, . . .		2,590 31

By Sales in January, ...	$650 00	
" " " February, ...	525 00	
" " " March, ...	815 00	
" " " April, ...	1,671 00	
" " " May, ...	2,512 00	
" " " June, ...	1,988 00	
" " " July, ...	722 50	
" " " August, ...	2,648 00	
" " " September, ...	1,112 00	
" " " October, ...	1,717 00	
" " " November, ...	918 00	
" " " December, ...	371 00	
	$15,649 50	
Less paid for Lot and Graves repurchased, .	654 00	
	$14,995 50	
Deduct for Annual Expenses as per Charter, .	1,400 00	
Mass. Horticultural Society, one-fourth part of	$13,595 50	$3.398 87
Balance carried to new account, ...		2,590 31
		$5,989 18

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

BOSTON, December 30, 1876.

MOUNT AUBURN CEMETERY CORPORATION,
Office, No. 16 PEMBERTON SQUARE.

BOSTON, January 1, 1877.

To the Finance Committee of the Mass. Hort. Society:

GENTLEMEN,—Herewith please find account for the year 1876, showing a balance to the *debit* of the Massachusetts Horticultural Society of $2,590.31.

To account for this unusual result you have only to refer to the sales for the past year, which have been very much less than previous years; and on the opposite side of the account you will observe we have expended on the new receiving tomb $9,539.93, and in grading the "Stone Farm" and preparing land for sale, $8,643.65, besides the amount paid the Town of Watertown for the right of using lands for burial purposes.

These expenditures have had the unanimous approval of the Board of Trustees, as matters of necessity and conducive to the best interest of all concerned.

Very respectfully, your obedient servant,

H. B. MACKINTOSH, *Treasurer.*

MASSACHUSETTS HORTICULTURAL SOCIETY,

To the Proprietors of the Cemetery of Mount Auburn, *Dr.*

For one-fourth (¼) part of the following expenditures for grading lands and building New Receiving Tomb, during 1876:

June 30.	*Grading, between Althea and Clethra Paths.*		
116¼ days, man's labor,		$217 97	
58 " man and horse,		203 00	
			$420 97
June 30.	*Grading, between Spruce and Mound Avenues.*		
74¾ days, man's labor,		140 16	
23¾ " man and horse,		83 12	
			223 28
July 31.	*Grading, near Halcyon Lake.*		
248½ days, man's labor,		465 94	
48½ " man and horse,		169 75	
			35 69
Dec. 26.	*Grading, on Fountain Avenue near Lime.*		
442 days, man's labor,		828 75	
151½ " man and horse,		530 25	
			1,359 00
Amount carried forward,			$2,638 94

Amount brought forward,		$2,638 94

Grading land on Stone Farm, and filling large hollow on line of Old Stockade Fence.

March 31.		
James Brown's bill, hauling and filling 740 yards,	$148 00	
S. Dunwoody's " " " " 2,432 "	486 40	
Dec. 16.		
1,914 days, man's labor,	3,588 75	
1,263 " man and horse,	4,420 50	
		8,643 65

Dec. 26. *New Receiving Tomb.*

6,000 face brick, at $20 per M,	120 00	
144,500 hard brick, " 8 " "	1,156 00	
100 soft brick, " 7 " "	70	
105¾ tons granite foundation stone, at $2 per ton,	211 50	
195 bbls. cement, at $1.50,	292 50	
14½ " lime, " 1.10,	15 95	
91 loads sand, " .60,	54 60	
Cook, Rymes & Co.'s bill, iron gates,	492 00	
Bowker, Torrey & Co.'s bill, marble doors (catacombs),	659 60	
Blessington & Co.'s bill, granite curbing,	75 00	
Smith & Lovett's bill, ventilators and expressage,	55 75	
W. J. McPherson & Co.'s bill, stained window,	50 50	
T. F. McGann's bill, brass handles,	140 00	
Parkers & Barnes' bill, asphalt and labor,	131 14	
N. W. Turner & Co.'s bill, gas fixtures,	110 00	
Cambridge Gas Light Co.'s bill, piping from street,	161 30	
G. F. Dickson's bill, gas fitting,	32 76	
Morse & Whyte's bill, brass wire netting,	8 00	
25,260 square feet of sods, at 2¼ cts. per ft.,	568 35	
9⅜ cords manure, at $10.00 per cord,	93 75	
1,144 lbs. of lead, " .07¼ " lb.	82 94	
26¾ lbs. brass wire, 3-16, " .42 " "	11 24	
Brass for washers to handles,	1 24	
Rubber fenders for gates, and hardware,	1 94	
Padlock,	1 87	
Bolts, screws, keys, and hardware,	2 95	
12 feet brass chain (window),	1 50	
M. C. Warren's bill, 1 brass pulley,	42	
1 keg nails for centres, and 20 lbs. wro't nails,	4 70	
2 bars iron, 1½x5-16, 47 lbs.; and 72 lbs. ¾ in.,	2 94	
A. S. Trier's bill, hardware,	99	
Kohr & Ripley's bill, iron grating and express,	20 85	
A. McDonald's bill, marble and stone cutting,	116 36	
Amounts carried forward,	$4,679 34	$11,282 59

Amounts brought forward,		$4,679 34	$11,282 59
Dec. 26.			
J. W. Grigg's bill, 810 feet slate fronts, and 2,578.5 square feet slate shelves,		1,248 49	
Lumber for centres, frames, etc.:			
2,208 ft. pl'd boards, $55.20; 403 ft. spruce, $6.45, 851 " sheathing, $34.24; 1,609 ft. pl'd pine bd's, $38.62; 142 ft. 2x8 spruce, $2.27; 259 ft. spruce, $4.15; 59 ft. 4x6 spruce, $1; 119 ft. spruce, $1.76; 401 ft. hard pine, sawed, $21.85; 51 ft. spruce, .82; 91 ft. 3 in. plank, $4.85; 405 ft. pl'd boards, $8.91; sawing, 30c.,		180 42	
Sherburne & Co., bill for lights,		5 00	
Hutchinson & Rogers, bill for canvas,		43 85	
R. & W. Sherburne's bill for glass,		5 68	
Paints and Oils:			
7 lbs. Paris Green, $2.94; spirits turp'e, benzine, &c., $2.25; 2 galls. alcohol, $6; 2 galls. linseed oil, $1.25; 60 lbs. mixed red paint, $12,		24 44	
23¾ days carpenter on centres, window, &c.,	$2.75,	63 94	
617¼ " masons,	2.87½,	1,774 59	
52¼ " man, tending,	2.87½,	150 21	
48¾ " painting and cleaning,	2.00,	97 50	
384¼ " labor,	1.87½,	720 47	
156 " man and horse,	3.50,	546 00	
			9,539 93
Total amount for 1876,			$20,822 52
One-fourth is			$5,205 63

MT. AUBURN, Dec. 30, 1876.

J. W. LOVERING, *Sup't.*

I certify the foregoing to be a true copy of accounts of improvements for the year 1876, rendered by the Superintendent.

H. B. MACKINTOSH, *Treasurer.*

[COPY.]

WATERTOWN, Feb. 4, 1876.

PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN.

TO TOWN OF WATERTOWN.

Williams Lot.

Taxes and expenses of sale for 1872,	$90 85
Interest to date,	14 77
Recording deed, $1.15; drawing release, $2,	3 15
Taxes for 1873, and interest to date,	133 90
" " 1874, " " "	135 67
Amount carried forward,	$378 34

Amount brought forward,	$378 34
Chant Lot.	
Taxes for 1874. and interest to date,	38 47
Taxes on Williams and Chant Lots for 1875, and interest,	152 49
	$569 20
Add ½ charges of E. R. Hoar, Referee,	25 00
Total,	$594 20

Rec'd Pay't, Town of Watertown.

By JOHN B. GOODRICH,

Att'y for Town.

Approved:

I. M. SPELMAN, *Pres't.*

[COPY.]

Know all Men by these Presents, that the Town of Watertown, by its Selectmen, thereto duly authorized by vote passed at a town meeting held on the sixth day of March, 1876, in consideration of the sum of twenty-five hundred dollars ($2500), to it paid by the Proprietors of the Cemetery of Mount Auburn, the receipt of which is hereby acknowledged, hereby permits the use for the purposes of burial of all the lands in said Town, included within the present enclosure of the Cemetery of said Corporation. A plan of the lands referred to has been filed in the Registry of Deeds of the County of Middlesex, Southern District.

Dated this ninth day of June, 1876.

The Town of Watertown by its Selectmen.

W. H. INGRAHAM.
OLIVER SHAW.
H. W. MACRUDY.
N. C. SANGER.
WARD M. OTIS.

Approved for $2500.

I. M. SPELMAN, *Pres't.*

[COPY.]

BOSTON. April 13, 1876.

PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN.

To H. W. PAINE, DR.

To services in the matter between you and Watertown, before Judge Hoar, Referee,	$40 00

Approved:

I. M. SPELMAN, *Pres't.*

REPORT

OF THE

COMMITTEE ON THE CENTENNIAL EXPOSITION.

The Committee appointed to co-operate in the International Exposition at Philadelphia, report as follows:

Early in the season a circular was prepared by the Committee setting forth the object of their appointment, and soliciting contributions of fruit to be sent to the Society's Hall, to be forwarded thence to the Centennial Exposition and displayed at the expense of the Society. Copies of this circular were sent freely to every Agricultural and Horticultural Society and Farmers' Club throughout the State, and also to Agricultural and Horticultural Journals and individuals interested in fruit growing. The response to this circular was not equal to the hopes of the Committee, but a single Society—the influential and active Worcester County Horticultural Society—and a few individuals outside of the regular contributors to our own exhibitions, taking part in the Exposition. As soon as the possibility of this result was foreseen, increased exertions were made to secure contributions from those who could be reached by personal application, and the display finally made was agreed by all, especially when the predominance of the manufacturing and commercial interests are taken into consideration, to be highly creditable to the State. The number of dishes of pears exhibited was 863, apples 214, grapes 18, making a total of 1095 dishes—a much larger number than were shown at our own Annual Exhibition. The Committee were surprised to find the number of dishes of pears from Massachusetts greater than from all the other States together, affording new proof that no part of our country is more favorable for the growth of this fruit than Eastern Massachusetts.

The Committee congratulate the Society and the State on the commendable exhibit they made in the great Exposition, showing the very deep interest felt in Pomology, and particularly in the growth of the pear. Undoubtedly the show of apples would have

been hardly less extensive than that of pears, had the Western parts of the State contributed as liberally as the Eastern, where the apple is not so extensively cultivated. As an exposition of the pomological products of our State, your Committee feel that the part taken by our Society has resulted in bringing out a much greater show than would probably have been gathered together without its aid.

The exhibition, as a whole, though certainly not all that it might have been, has probably never been equalled in extent in any country. The whole number of dishes of fruit shown was fifteen thousand. The largest similar exhibition previously made in this country was that of the American Pomological Society at Chicago, in 1875, when about six thousand dishes were shown. The most prominent feature of the exhibition was the profuse display of apples from Kansas, Nebraska, Iowa, and other Western States, Kansas making also a grand exhibition of fruit in the State building. The collection of fifty-six varieties of plums from Ellwanger & Barry, of Rochester, N. Y., was such as is not often seen in these days. The only place beyond the limits of the United States from which fruit was sent was Canada. The Canadian crab and other apples were remarkable for high color, and the show of plums was also extensive and beautiful. The largest show of peaches was from Michigan. Some idea of the exhibition may be formed by those who witnessed the show made here in 1873 by the American Pomological Society, and bearing in mind that the Pomological Building at the Centennial was nearly two hundred feet square, covering four-fifths of an acre — about eight times the area of our larger hall — and that the greater part of the sixty tables which filled this immense space were crowded with fruit.

The whole amount expended out of the appropriation of $1,000 is $340.81.

The names of the contributors from Massachusetts, with the number of dishes of apples, pears, and grapes exhibited by each, are as follows:

Marshall P. Wilder, Boston, . .	300 pears.	
Hovey & Co., Cambridge, . .	175 "	
C. E. Richardson, Cambridge, . .	20 "	
Joseph H. Fenno, Revere, . .	44 "	42 apples.
Benjamin G. Smith, Cambridge, .	47 "	27 "
Alexander Dickinson, Cambridgeport,	50 "	

John Cummings, Woburn, . .	33 pears.	27 apples.
J. W. Manning, Reading, . .	3 "	24 "
Simon Lamprell, Marblehead, . .	9 "	3 "
C. E. Grant, Boston Highlands, .	8 "	
Griffin & Dolan, Cambridgeport, .	16 "	
A. S. M'Intosh, Boston Highlands, .	8 "	
Charles F. Curtis, Jamaica Plain, .	17 "	
Josiah Newhall, Lynnfield, . .		15 "
F. & L. Clapp, Dorchester, . .	30 "	
Amos Bates, Hingham, . . .	13 "	
Mrs. Sarah D. Fisk, Hingham, .	10 "	
Samuel Hartwell, Lincoln, . .		18 "
Robert Manning, Salem, . . .	35 "	
Charles H. Allen, Salem, Orange pears from a tree 235 years old, .	1 "	
William Endicott, Danversport, Endicott pears, from the tree planted by his ancestor, Governor Endicott in 1630, ...	1 "	
John Pickering, Salem, Warden pears, from a tree grafted April 19, 1775,	1 "	
Ezekiel Doane, Eastham, Fall pears, from the tree planted by Governor Prince, as early as 1650, . .	1 "	
Jacob Steigleder, Shelburne Falls. .	18 grapes.	

The following were collected by the Worcester County Horticultural Society.

O. B. Hadwen,	Worcester, .	2 pears.	15 apples.
Isaac Mills,	" .	3 "	9 "
Henry Phelps,	" .	7 "	
William G. Maynard,	" .	1 "	2 "
Mrs. G. A. Chamberlain,	" .	2 "	6 "
Edward S. Howes,	" .		4 "
Stephen Salisbury,	" .	5 "	5 "
Alfred Davis,	" .		2 "
William H. Earle,	" .	6 "	
John C. Newton,	" .	1 "	
Edward W. Lincoln,	" .	2 "	
Mrs. Francis O. Eastman.	" .		1 "

H. O. Western,	Worcester, .	1 pears.	
Charles Nash,	" .		1 apples.
Moses Church,	" .	2 "	
F. M. Marble,	" .	1 "	
W. T. Merrifield,	" .	2 "	
Lorin Coes,	" .	2 "	
Newell Wood, Millbury, . . .		1 "	8 "
Joseph C. Lovell, West Boylston, .		3 "	3 "
Mrs. Sarah D. Shaff, Leicester, .			2 "

Permission was granted by the Society to add to this report the awards made by the Centennial Commission, when received. These awards are understood to consist of a medal, and a statement by the judges of the merits of the object exhibited, the latter being the essential part. Every effort has been made by the Committee to procure a copy of these statements, but without success. They can only say, therefore, that an award has been made to the Massachusetts Horticultural Society for a large collection of Apples, and another for Pears; one to the Worcester County Horticultural Society, for Apples, and another for Pears; and awards to Messrs. Wilder, Hovey & Co., Fenno, Smith, Dickinson, Griffin & Dolan, Curtis, Clapp, Bates, R. Manning, Hadwen, Earle, Newton, and Lincoln, and Mrs. Chamberlain, for Pears; and to Messrs. Fenno. Smith, Cummings, J. W. Manning, and Hartwell, for Apples.

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C. M. HOVEY,
BENJAMIN G. SMITH,
JOHN C. HOVEY,
ROBERT MANNING,
E. W. BUSWELL,
HERVEY DAVIS,
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Massachusetts Horticultural Society.

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Thomas Hogg, New York.
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Ames, F. M.,	Canton.
Ames, George,	Boston.
Ames, P. A.,	"
Amory, Charles,	"
Amory, Frederick,	Brookline.
Amory, James S.,	Boston.
Andrews, Charles L.,	Swampscott.
Andrews, Frank W.,	Boston.
Andrews, W. T.,	"
Andros, Milton,	Brookline.
Appleton, Edward,	Reading.
Appleton, Francis H.,	West Peabody.
Appleton, Wm. S.,	Boston.
Atkins, Elisha,	Belmont.
Austin, William R.,	Dorchester.
Avery, Edward,	Boston.
Ayer, Adams,	"
Ayling, Isaac,	"
Bacon, George,	Brookline.
Bailey, Edwin C.,	Boston.
Baker, Wm. E.,	"
Bancroft, J. C.,	Milton.
Banfield, F. L.,	Boston.
Barnard, Rev. C. F.,	"
Barnard, James M.,	"
Barnard, R. M.,	Everett.
Barnes, Walter S.,	Somerville.
Barnes, Wm. H.,	Boston.
Barney, Levi C.,	"
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Barrett, Aaron,	Malden.
Barrows, Thomas,	Dedham.
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Bates, Amos,	Hingham.
Bates, Caleb,	Kingston.
Bayley, John P.,	Boston.
Beal, Alexander,	Dorchester.
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Blaney, Henry,	Brookline.
Blinn, R. D.,	Lexington.
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Bockus, C. E.,	Dorchester.
Bond, George W.,	Boston.
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Bowditch, J. Ingersoll	Boston.
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Brackett, C. N.,	Newton.
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Brewer, Otis,	"
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Bright, William E.,	"
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Brintnall, Benj.,	"
Brooks, Francis,	Medford.

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Brooks, Peter C.,	Boston.
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Brown, Edward J.,	Brookline.
Brown, G. Barnard,	Boston.
Brown, George B.,	"
Brown, Jacob,	Woburn.
Brownell, E. S.,	Essex Junc., Vt.
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Chandler, J. G.,	S. Lancaster.
Chapin, N. G.,	Brookline.
Chapman, Edward,	Arlington.
Chase, A. J.,	Lynn.
Chase, Daniel E.,	Somerville.
Chase, Hezekiah S.,	Boston.
Chase, William M.,	Worcester.
Cheney, B. P.,	Boston.
Child, F. J.,	Cambridge.
Child, Wm. C.,	Medford.
Childs, Francis,	Charlestown.
Childs, N. R.,	Dorchester.
Claflin, Henry,	Brighton.
Claflin, Wm.,	Newton.
Clapp, Edward B.,	Boston.
Clapp, E. W.,	Walpole.
Clapp, J. H.,	Boston.
Clapp, Lemuel,	Dorchester.
Clapp, Wm. C.,	"
Clark, Orus,	Boston.
Clark, W. L.,	Neponset.
Clark, Wm. S.,	Amherst.
Clarke, Miss Cora H.,	Jamaica Plain.
Clay, Henry,	Dorchester.
Cleary, Lawrence,	West Roxbury.
Clement, Asa,	Dracut.
Cleveland, Ira,	Dedham.
Cobb, Albert A.,	Brookline.
Coburn, Isaac E.,	Everett.
Codman, James M.,	Brookline.
Codman, Ogden,	Lincoln.
Coffin, G. Winthrop,	West Roxbury.
Coffin, Wm. E.,	Boston.
Comer, G. N.,	Dedham.
Converse, E. S.,	Malden.
Coolidge, Joshua,	Watertown.
Copeland, Franklin,	West Dedham.
Courtis, William,	Marblehead.
Cox, George P.,	Malden.
Coy, Samuel I.,	Boston.
Craft, George,	Brookline.
Crocker, Uriel,	Boston.
Crosby, Josiah,	Arlington.
Crowell, Philander,	Chelsea.
Crowell, R. H.,	"
Cruickshanks, James,	"
Cummings, John,	Woburn.
Curtis, Chas. F.,	West Roxbury.
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Cushing, J. G.,	Boston.
Cushing, R. M.,	"
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Davenport, Henry,	Boston.
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Davis, Hervey,	Cambridgeport.
Dawson, Jackson,	West Roxbury.
Deblois, S. G.,	Boston.
Denny, C. H.,	"
Denny, R. S.,	Dorchester.

Denton, Eben,	Braintree.
DeWolf, John L.,	Boston.
Dewson, F. A.,	Boston.
Dexter, F. Gordon,	"
Dickerman, Geo. H.,	Somerville.
Dickinson, Alex.,	Cambridgeport
Dike, Charles C.,	Stoneham.
Dix, Joseph,	Boston.
Dorr, George,	Dorchester.
Dove, George W. W.,	Andover.
Downer, Samuel,	Dorchester.
Durant, H. F.,	Boston.
Durant, William,	"
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Durfee, George B.,	"
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Everett, George,	Concord.
Everett, Otis,	Boston.
Everett, William,	"
Farlow, John S.,	Newton.
Faxon, John,	Quincy.
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Flagg, Augustus,	"
Fleming, Edwin,	West Newton.
Fleming, William,	" "
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Fuller, Henry Weld,	"

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Gregory, J. J. H.,	Marblehead.
Greig, George,	Newton.
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Groom, Thomas,	Dorchester.
Grundel, H.,	"
Guild, J. Anson,	Brookline.
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Hall, George R.,	Boston.
Hall, John R.,	"
Hall, Lewis,	Cambridge.
Hall, Stephen A.,	Revere.
Hall, William F.,	Brookline.
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Hammond, Gard. G.,	"
Hammond, Samuel,	"
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Harding, G. W.,	Dorchester.
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Harding, W. C.,	"
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Haughton, James,	Boston.
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Hayes, Francis B.,	Boston.
Hazeltine, H.,	"
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Hitchings, E. H.,	Boston.
Hodgkins, John E.,	Chelsea.
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Hooper, Thomas,	Bridgewater.
Horner, Mrs. C. N. S.,	Georgetown.
Hovey, C. H.,	Cambridge.
Hovey, C. M.,	"
Hovey, John C.,	Cambridgeport.
Hovey, P. B.,	"
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Howland, John, Jr.,	New Bedford.
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Hubbard, G. G.,	Cambridge.
Hubbard, J. C.,	Boston.
Hubbard, W. J.,	"
Huckins, J. W.,	"
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Hunneman, Jos. H.,	Boston.
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Hunt, Franklin,	Boston.
Hunt, Moses,	"
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Kakas, Edward,	Medford.
Kelley, E. G.,	Newburyport.
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Kendall, Edward,	Cambridgeport.
Kendall, J. R.,	Woburn.
Kendrick, Mrs. H. P.,	Allston.
Kennedy, G. G.,	Boston.
Kenney, John M.,	Wareham.
Kent, John,	Charlestown.
Keyes, E. W.,	Denver, Col.
Keyes, George,	Concord.
Kidder, H. P.,	Boston.
Kimball, A. P.,	"
King, Franklin,	Dorchester.
King, William S.,	Boston.
Kingman, A. A.,	Brookline.
Kingman, C. D.,	Middleborough.
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Kittredge, E. A.,	Boston.
Lamb, Thomas,	Boston.
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Lawrence, Edward,	Charlestown.
Lawrence, James,	Boston.
Lawrence, James,	Groton.
Lawrence, John,	Boston.
Lawson, Peter,	Lowell.
Leavens, S. Davis,	Boston.
Lee, Henry,	"
Lemme, Frederick,	No. Cambridge.
Leuchars, R. B.,	Boston.
Lewis, A. S.,	Framingham.
Lewis, William G.,	"
Lincoln, D. Waldo,	Worcester.
Lincoln, George,	Hingham.
Locke, W. H.,	Belmont.
Lodge, Giles H.,	Swampscott.
Loftus, John P.,	Boston.
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Lord, George C.,	Newton.
Loring, Alfred,	South Hingham.
Loring, C. W.,	Boston.
Lothrop, Eben W.,	Chelsea.
Lovett, G. L.,	Boston.
Low, Ariel,	"
Lowder, John,	Watertown.
Lowell, Augustus,	Boston.
Luke, Elijah H.,	Cambridgeport.
Lumb, Wm.,	Boston.
Lunt, C. H.,	Jamaica Plain.
Lyman, Theodore,	Brookline.
Lyon, Henry,	Charlestown.
Mahoney, John,	Boston.
Maloon, William,	Salem.

Mann, James F.,	Cambridge.	Packer, C. H.,	Boston.
Mann. Jonathan,	"	Page, Thomas,	Milwaukee.
Manning, J. W.,	Reading.	Paine, Robert T.,	Boston.
Manning, Mrs. L. B.,	"	Palmer, J. P.,	"
Manning, Robert,	Salem.	Park, J. C.,	Somerville.
Mansfield, H. S.,	Blackstone.	Parker, Augustus,	Boston.
Marland, A.,	Andover.	Parker, James,	"
Marsh, Francis,	Dedham.	Parker, William A.,	"
Marshall, Frederick,	Everett.	Parkman, Francis,	Jamaica Plain.
Martin, D. A.,	Chelsea.	Partridge, Henry,	Dunkirk, N. Y.
Martin, J. S.,	Boston.	Partridge, Horace,	Somerville.
Mason, R. M.,	"	Pearce, John,	West Roxbury.
Matthews, Nathan,	"	Peck, O. H.,	Franklin.
McCarthy, T.,	"	Peck, W. G.,	Arlington.
McClure, John,	Revere.	Penniman, A. P.,	Waltham.
Merriam. M. H.,	Lexington.	Perkins, AugustusT.,	Boston.
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Miller, E. D.,	Dorchester.	Perkins, William P.,	"
Millmore, M.,	Boston.	Perry, George W.,	Malden.
Mills, Charles H.,	"	Philbrick, WilliamD.,	Newton Centre.
Milton, W. H.,	"	Pierce, George W.,	Everett.
Minott, Charles,	Somerville.	Pierce, Henry L.,	Dorchester.
Minton, James,	Dorchester.	Pierce, S. B.,	"
Mixter, Charles,	Boston.	Poole, Benjamin C.,	Chelsea.
Moore, John B.,	Concord.	Poor, John R.,	Somerville.
Morrill, Joseph, Jr.,	Boston.	Pope, Alexander,	Dorchester.
Morse, S. B.,	"	Potter, Joseph S.,	Arlington.
Morse, Samuel F.,	"	Prang, L.,	Boston.
Motley, Thomas,	West Roxbury.	Pratt, Robert M.,	"
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Mudge, George A ,	Brookline.	Pray, Mark W.,	Malden.
Mudge, Geo. W.,	Lynn.	Prescott, C. H.,	Cornwallis, N.S.
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Munroe, William,	"	Prescott, W. G.,	Boston.
		Prescott, William G.,	Quincy.
Needham, Daniel,	Groton.	Preston, George H.,	Boston.
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Newhall, Josiah,	Lynnfield.	Proctor, Thos. P.,	West Roxbury.
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Otis, T. C.,	"	Rand, Oliver J.,	Cambridgeport.
Oxnard, George D.,	"	Rawson, W. W.,	Arlington.

Rayner, John J.,	Lexington.
Reed, George W.,	Boston.
Richards, John J.,	Boston.
Richards, William B.,	"
Richardson, C. E.,	"
Richardson, Geo. C.,	Cambridge.
Robbins, Nathan,	Arlington.
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Robinson, John,	Salem.
Robinson, J. H.,	Dorchester.
Rogers, John H.,	Boston.
Ross, Henry,	Newton.
Ross, M. D.,	Boston.
Ross, Waldo O.,	"
Russell, George,	W. Somerville.
Russell, N. P.,	Boston.
Russell, Walter,	Arlington.
Sampson, G. R.,	New York.
Sanborn, Amos C.,	Cambridgeport.
Sandford, O. S.,	Cordaville.
Sargent, Charles S.,	Brookline.
Sargent, Ignatius,	"
Sargent, Turner,	Boston.
Saville, R. L.,	Brookline.
Sawyer, E. H.,	Easthampton.
Sawyer, Timothy T.,	Charlestown.
Scott, Charles,	Newton.
Scudder, C. W.,	Brookline.
Seaver, Nathaniel,	East Boston.
Seaver, Robert,	Jamaica Plain.
Shaw, C. C.,	Boston.
Shaw, S. P.,	Cambridge.
Sheafe, Charles C.,	Boston.
Sheafe, William,	Brookline.
Sheldon, O. S.,	Milton.
Shimmin, Charles F.,	Boston.
Shorey, John L.,	Lynn.
Skinner, Francis,	Boston.
Slack, Chas. W.,	"
Slack, Lewis,	Brookline.
Smith, Benjamin G.,	Cambridge.
Smith, Charles A.,	Boston.
Smith, Charles H.,	Jamaica Plain.
Smith, Chauncy,	Cambridge.
Smith, E. N.,	Boston.
Smith, George O.,	"
Smith, James H.,	Needham.
Smith, Joshua B.,	Cambridgeport.
Smith, Peter,	Andover.
Smith, W. B.,	Boston.
Snow, Eben,	Cambridge.
Southmayd, John K.,	Boston.
Sparhawk, Edwd. C.,	Brighton.
Sparhawk, Geo.,	Lexington.
Spaulding, Edward,	Jamaica Plain.
Spaulding, M. D.,	Boston.
Speare, Alden,	Newton Centre.
Springall, George,	Malden.
Springer, John,	Sterling.
Stetson, James A.,	Quincy.
Stetson, Nahum,	Bridgewater.
Stickney, Rufus B.,	Somerville.
Stimpson, George,	New York.
Stimpson, H. H.,	Cambridge.
Stone, Amos,	Everett.
Stone, G. F.,	Newton.
Stone, Phineas J.,	Charlestown.
Story, E. A.,	Brighton.
Strong, William C.,	"
Sturgis, John H.,	Boston.
Sturgis, Russell, Jr.,	"
Sturtevant, E. Lewis,	S. Framingham.
Sumner, Edward,	Dedham.
Surette, L. A.,	Concord.
Swain, Charles D.,	Roxbury.
Taft, John B.,	Boston.
Tappan, Charles,	"
Taylor, Horace B.,	"
Thacher, Alfred C.,	Dorchester.
Thayer, Henry,	N. Cambridge.
Thayer, Nathaniel,	Boston.
Thompson, S. Benton,	Lexington.
Thorndike, John H.,	Boston.
Thurlow, T. C.,	Newburyport.
Tilton Stephen W.,	Boston.
Todd, John,	Hingham.
Tolman, Benj.,	Concord.
Tolman, Miss H. S.,	Boston.
Torrey, Everett,	Charlestown.
Turner, J. M.,	Dorchester.
Turner, R. W.,	Newton.
Turner, Royal W.,	Randolph.

Underwood, Guy C.,	Boston.
Upham, Henry,	Brookline.
Vinton, A. H., D. D.,	Boston.
Vose, B. C.,	Hyde Park.
Wainwright, Peter,	Boston.
Wainwright, Wm. L.,	Braintree.
Wakefield, E. H.,	Chelsea.
Walcott, Edward,	Pawtucket.
Walcott, Henry P.,	Cambridge.
Walker, Edw. C. R.,	Boston.
Walker, Samuel A.,	"
Walker, T. W.,	Waltham.
Walley, Mrs. W. P.,	Boston.
Ward, John,	Newton.
Wardwell, W. H.,	Newton Centre.
Ware, Benjamin P.,	Marblehead.
Warren, G. W.,	Boston.
Wason, E.,	Brookline.
Waters, Edwin F.,	Newton Centre.
Waters, George F.,	Newton.
Watts, Isaac,	Belmont.
Webber, A. D.,	Boston.
Weld, Aaron D.,	West Roxbury.
Weld, Dr. M. W.,	Boston.
Weld, Richard H.,	"
Weld, W. G.,	Brookline.
Weston, Seth,	Revere.
Wetherell, Leander,	Boston.
Wheelwright, A. C.,	"
Whipple, John A.,	Boston.
Whitcomb, Wm. B.,	Medford.
White, B. C.,	Boston.
White, Edward A.,	"
White, Francis A.,	Brookline.
Whiteley, Edward,	Cambridge.
Whiting, Nathaniel,	Brookline.
Whitmore, C. O.,	Boston.
Whitney, Luther F.,	Charlestown.
Whittle, George W.,	Somerville.
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Wilbur, G. B.,	Watertown.
Wilcutt, Levi L.,	West Roxbury.
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Wilder, Marshall P.,	Dorchester.
Williams, Aaron D.,	Boston.
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Winship, F. Lyman,	Brighton.
Winship, Herman,	"
Woerd, C. V.,	Waltham.
Woerd, C. V., Jr.,	"
Wood, L. H.,	Marlborough.
Wood, R. W.,	Jamaica Plain.
Wood, Wm. K.,	West Newton.
Woodward, Royal,	Brookline.
Wright, George C.,	West Acton.
Wrisley, Frank,	New York.

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Allen, Calvin,	Boston.
Allen, E. L.,	"
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Atkinson, W. B.,	Newburyport.
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Breck, C. H. B.,	"
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Brown, Jona., Jr.,	Somerville.
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Clark, Joseph W.,	Dedham.
Cobb, Edward W.,	Boston.
Cobb, Jonathan H.,	Dedham.
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Comley, James,	Lexington.	Foley, Bernard,	Boston.
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Cruickshank, J. T.,	Natick.	French, W. E.,	"
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Curtis, Joseph H.,	"	Frost, Rufus S.,	Chelsea.
Cutter, Geo. B.,	Weston.	Frost, Stiles,	West Newton.
		Frothingham, I. H.,	Dorchester.
Dana, Luther,	Newton.	Fuller, W. G.,	Stoneham.
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Denison, J. N.,	"	Gay, Samuel S.,	Boston.
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Doogue, William,	"	Gilbert, Samuel,	"
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Dupee, James A.,	Brookline.	Gleason, C. W.,	oston.
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		Goddard, Thomas,	Boston.
Eaton, Jacob,	Cambridgeport.	Goodwin, Lester,	Brighton.
Eaton, Russell P.,	Dorchester.	Gove, George G.,	Cambridge.
Edgar, William,	Newtonville.	Grant, Charles E.,	Boston.
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Eustis, James,	Wakefield.	Gray, Edward,	Boston.
Ewings, L. B.,	Boston.	Gray, John C.,	"
		Gray, Wm., Jr.,	Dorchester.
Falconer, James,	Boston.	Gray, Wm., 3d.,	"
Falconer, John,	Rochester.	Greenwood, E. H.,	Newton Centre.
Farrar, Abijah W.,	Boston.	Grew, Henry,	Dorchester.
Farrier, Amasa,	Stoneham.	Guerineau, Louis,	Malden.
Farrier, Mrs. C.,	"		
Fay, Henry G.,	Brookline.	Hadley, T. B.,	Stoneham.

Haines, Robert J.,	Boston.
Haley, Jesse,	Cambridgeport.
Hall, H. H.,	Lawrence.
Hall, William T.,	Revere.
Hamlin, D. A.,	South Boston.
Harris, Miss Ellen M.,	Jamaica Plain.
Harris, F. L.,	West Needham.
Hartwell, Samuel,	Lincoln.
Harwood, Geo. S.,	Newton.
Haskell, Edward,	New Bedford.
Hatch, Samuel,	Boston.
Hayes, John L.,	Cambridge.
Hayward Geo. P.,	Hingham.
Hayward, James T.,	Boston.
Hazelton, H. L.,	"
Heath, Geo. W.,	Melrose.
Heustis, Warren,	Belmont.
Hews, Albert H.,	No. Cambridge.
Higbee, C. H.,	Salem.
Hill, Benj. D.,	Peabody.
Hill, Henry Y.,	Belmont.
Hilliard, George S.,	Boston.
Hinckley, Mrs. D. F.,	Chelsea.
Hittinger, Miss M.E.,	Belmont.
Hodgdon, R. L.,	Arlington.
Holmes, G. W.,	Boston.
Howe, Estes,	Cambridge.
Howe, Rufus,	Marlboro'.
Hubbard, J. W.,	Boston.
Humphrey, G. W.,	Dedham.
Humphrey, John,	Dover.
Hyde, George,	Charlestown.
Ireland, George W.,	Somerville.
Jameson, G. W.,	East Lexington.
Johnson, H. A.,	Jamaica Plain.
Jones, George H.,	Newton.
Jones, Moses,	Brookline.
Jordan, Samuel,	Yarmouth.
Kelsey, Fred W.,	Waverly, N. Y.
Kendall, Jonas,	Framingham.
Kennard, Chas. W.,	Boston.
Kennard, M. P.,	Brookline.
Kenrick, Miss A. C.,	Newton.
Kingman, Abner,	Boston.
Lamprell, Simon,	Marblehead.
Lang, John H. B.,	Dorchester.
Langworthy, I. P.,	Chelsea.
Law, G. A.,	Roslindale.
Leavens, E. W.,	Malden.
Lee, Francis H.,	Salem.
Lee, Francis L.,	Brookline.
Leeds, Samuel,	South Boston.
Leonard, Joseph,	Boston.
Lincoln, Calvin A.,	Hingham.
Lincoln, F. W., Jr.,	Boston.
Livermore, Isaac,	Cambridgeport.
Livermore, Miss Maria,	Mt. Auburn.
Locke, B. D.,	Arlington.
Loring, Charles G.,	Boston.
Loring, John A.,	"
Lothrop, D. W.,	West Medford.
Lothrop, H. A.,	Sharon.
Lothrop, Thornton K.,	Boston.
Lowell, John,	Newton.
Markoe, G. F. H.,	Boston.
May, F. W. G.,	"
McDermott, Andrew,	"
McGee, James B.,	Peabody.
McIntire, Joseph,	Melrose.
McIntyre, James,	Malden.
McLaren, Anthony,	Forest Hills.
McTear, James,	Boston.
Mellen, George M.,	Brookline.
Merriam, Galen,	West Newton.
Merriam, Herbert,	Weston.
Merrick, John M.,	Walpole.
Merrill, J. Warren,	Cambridgeport.
Merrill, S. A.,	Danvers.
Millar, John L.,	Boston.
Miller, David,	"
Mills, William,	Somerville.
Minot, G. R.,	Boston.
Minot, William, Jr.,	"
Minton, P. J.,	Forest Hills.
M'Intosh, A. S.,	Boston.
Morandi, Francis,	Malden.
Morris, Thomas D.,	Boston.
Morrison, Hugh,	Gloucester.
Morse, E. R.,	Somerville.
Morse, W. A.,	Boston.
Morton, J. H.,	"
Murray, Daniel C.,	Brookline.

Muzzey, A. B.,	Cambridge.
Nichols, B. W.,	West Roxbury.
Nichols, J. R.,	Haverhill.
Northey, William,	Medford.
Norton, P.,	Boston.
Noyes, George N.,	Auburndale.
Nugent, James,	Boston.
O'Brien, James,	Jamaica Plain.
Odiorne, F. H.,	Malden.
Oldreive, Richard,	Newton.
Olney, Richard,	West Roxbury.
Owen, John,	Cambridge.
Paine, Benjamin F.,	Boston.
Palmer, Stevens G.,	"
Parker, Charles E.,	Auburndale.
Parker, Harvey D.,	Boston.
Parker, James M.,	Charlestown.
Parker, John,	Boston.
Parsons, William,	"
Parsons, William B.,	Rockport.
Patterson, James,	Cambridge.
Payson, Samuel R.,	Boston.
Perkins, S. C.,	Dorchester.
Pettingill, Thos. S.,	Brookline.
Philbrick, Edward S.,	Boston.
Phillips, Nathaniel,	Dorchester.
Phipps, Samuel, Jr.,	Boston.
Pillsbury, H. H.,	Medford.
Plimpton, W. P.,	West Newton.
Power, Charles J.,	S. Framingham.
Pratt, L. G.,	West Newton.
Pratt, Samuel,	Chelsea.
Preston, Jonathan,	Boston.
Prince, F. O.,	Winchester.
Putnam, C. A.,	Salem.
Putnam, Francis,	"
Putnam, H. W.,	"
Rand, George C.,	Newton Centre.
Randall, Macey,	Sharon.
Ranlett, Charles A.,	Billerica.
Ranlett, S. A.,	Melrose.
Ray, Edwin,	Boston.
Rice, George W.,	"
Richards, Francis,	"
Richards, John S.,	Brookline.
Richardson, E. P.,	Lawrence.
Richardson, Horace,	Framingham.
Roberts, Edward,	Hyde Park.
Rogers, John F.,	Cambridge.
Russell, George,	Boston.
Sargent, Wingate P.,	Melrose.
Saunders, Miss M. T.,	Salem.
Saville, George,	Quincy.
Sawtell, J. M.,	Fitchburg.
Schlegel, Adam,	Boston.
Scott, A. E.,	Lexington.
Scott, George H.,	Allston.
Shattuck, F. R.,	Boston.
Shaughnessy, J. J.,	"
Shedd, Abraham B.,	Lexington.
Shedd, Arthur B.,	"
Shepherd, C. W.,	West Newton.
Shepherd, Edwin,	Lowell.
Sherman, Japhet,	Medford.
Simpson, Michael H.,	Saxonville.
Sleeper, J. S.,	Boston.
Smallwood, Thomas,	Newton.
Smith, Edmund,	Cambridge.
Snow, E. A.,	Melrose.
Southworth, Edward,	Quincy.
Spooner, W. H.,	West Roxbury.
Sprague, Charles J.,	Boston.
Squire, J. P.,	Arlington.
Stanwood, E. How'd,	Grantville.
Starbird, Louis D.,	Malden.
Stearns, Charles,	Brookline.
Stone, Eliphalet,	Dedham.
Stone, Milton J.,	Brookline.
Stone, Samuel G.,	Charlestown.
Story, Miss Sarah W.,	Brighton.
Sullivan, J. L. D.,	Somerville.
Swan, C. W.,	Boston.
Tailby, Joseph,	Wellesley.
Tainter, A. E.,	Medford.
Talbot, Josiah W.,	Norwood.
Tallant, Miss C. L.,	Roxbury.
Tapper, Thomas,	Canton.
Taylor, Moses,	Acton.
Thatcher, L. P.,	Middleboro'.
Thompson, G. M.,	Waltham.

Tobey, Miss M. B.,	Brookline.
Todd, Jacob,	Boston.
Torrey, Augustus,	Beverly.
Tower, Elisha,	Lexington.
Trautman, Martin,	Boston.
Tucker, E. G.,	"
Turner, N. W.,	Everett.
Underwood, Wm. J.,	Belmont.
Vandine, Henry,	Cambridgeport.
Van Voorhies, H. W.,	Everett.
Vinton, Mrs. C. A.,	Boston.
Walker, Charles H.,	Chelsea.
Walker, Joseph T.,	Boston.
Walker, Wm. P.,	Somerville.
Wallis, M. L.,	West Roxbury.
Wallis, William,	Boston.
Walsh, M. H.,	Brighton.
Waltham, George,	Nahant.
Ward, Edward A.,	Cambridge.
Warren, Samuel D.,	Waltham.
Washburn, E. F.,	Neponset.
Washburn, G. W. C.,	Boston.
Watson, B. M.,	Plymouth.
Watson, David,	Malden.
Webster, J. R.,	Boston.
Webster, John,	Salem.
Wellington, Chas. A.,	E. Lexington.
Wellington, Jos. V.,	Cambridge.
Wells, Benjamin T.,	Boston.
Weston, Mrs. L. P.,	Danvers.
Wetherell, John G.,	Boston.
Wheatland, Henry,	Salem.
Wheeler, Miss Ann C.,	Cambridgeport.
Wheildon, Wm. W.,	Concord.
White, N. B.,	Norwood.
White, T. C.,	Charlestown.
Whitney, Joel,	Winchester.
Williams, Dudley,	Jamaica Plain.
Williams, H. W.,	Boston.
Williams, Stephen,	"
Wilmarth, H. D.,	Jamaica Plain.
Wilson, B. O.,	Watertown.
Wilson, Geo. W.,	Malden.
Wiswall, Artemas,	Newton.
Wiswall, Henry M.,	Watertown.
Wolcott, Mrs. J. W.,	Boston.
Wood, Mrs. Anna D.,	West Newton.
Wood, Miss C. S.,	"
Wood, Edmund M.,	Boston.
Wood, E. W.,	West Newton.
Woodbury, Chas.,	Beverly.
Woodford, Jos. H.,	Newton.
Young, Thos., Jr.,	Somerville.
Young, William,	Fall River.
Zirngiebel, D.,	Needham.

EXTRACTS FROM THE BY-LAWS.

SECTION XXVI.—Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member, having once paid an admission fee, may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII.—Admission Fee and Annual Assessment.

Every subscription member, before he receives his Diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an

admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX.—Discontinuance of Membership.

Any member who shall neglect for the space of two years to pay his annual assessment shall cease to be a member of the Society; and the Treasurer shall erase his name from the List of Members.

The attention of Annual Members is particularly called to Section XXIX.

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